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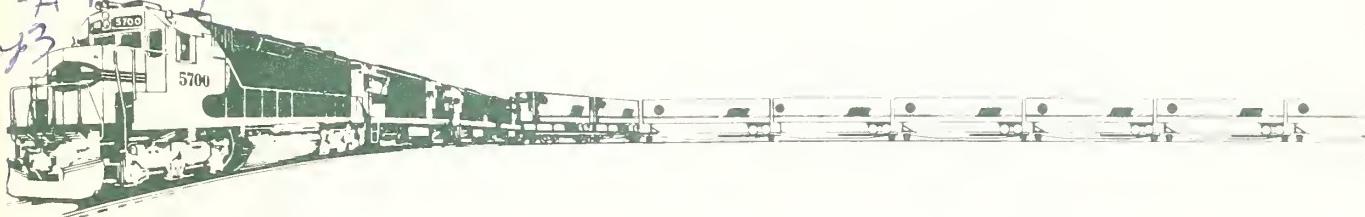
PIGGYBACKING FRESH VEGETABLES

California to the Midwest and Northeast

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PREFACE

The Cooperative Program of the U.S. Department of Agriculture's Economics, Statistics, and Cooperatives Service (ESCS), in cooperation with the Transportation Services Branch, Agricultural Marketing Service (AMS), conducted this study at the request of the Grower-Shipper Vegetable Association of Central California. We were asked to determine the best way to improve the present system of distributing perishable commodities.

The study was also to determine alternatives for obtaining truck trailers to be used in possible rail piggyback service. This would include an analysis of the organization structure -- farmer cooperative, shippers association, forwarding company or other -- necessary to finance and operate a shipper controlled program to transport produce from California to midwest and northeast markets.

Based on this request, study objectives were established to:

--Develop a profile of the present transportation and handling system.

--Evaluate service requirements for shippers, receivers, and products handled.

--Develop a best estimate of total truck and piggyback operating costs between California and the major midwestern and northeastern markets.

--Determine the transportation costs, service level, and volume that would offset the cost of owning or leasing and operating a private fleet of highway trucks and/or trailers for use in Trailer-On-Flatcar (TOFC) service, and

--Develop an organizational structure to implement and manage a feasible, alternative, transportation system.

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SUMMARY AND RECOMMENDATIONS

This study was prepared in response to a request from the Grower-Shipper Vegetable Association of Central California. The grower-shipper group is vitally concerned about the future availability of equipment, both rail and truck, for transporting the produce grown in California and Arizona to major markets, particularly in the Northeast.

In conducting the study, shipping flow data were obtained covering shipments to the Mississippi River and east from 14 grower-shippers for 1975 and 1976.

Analysis of these data showed that:

--During 1975-76 there were 32,649 shipments totaling more than 23 million cartons.

--Trucks, which hauled less than half of the shipments into this area in 1975, accounted for more than two-thirds of the volume in 1976.

--Twelve cities accounted for two-thirds of the total volume shipped.

--Seasonal shipping data showed May through September (5 months) represented 60 percent of the volume. Movement was fairly evenly distributed throughout the other 7 months.

--The percentage distribution of volume, by destination, from the study group compared closely to total industry flow data.

Information and data were also obtained from several major chain stores, railroads, trucking companies, equipment manufacturers, leasing companies, and freight forwarders.

From this information it was determined that:

--Reliability of scheduled arrival time in most instances was more important to receivers than speed alone.

--Most receivers would welcome the opportunity to participate in a shipper controlled supplemental Trailer-On-Flatcar (TOFC) 1/ shipping program.

--In general, railroads provide faster and more reliable arrival times for TOFC service than for mechanical refrigerated cars.

--Railroads would welcome an opportunity to provide TOFC service for shipper-owned trailers.

1/ In this report the terms TOFC and piggyback are used interchangeably.

--Many opportunities are available for obtaining the use and control of piggyback trailers through leasing and/or contract arrangements.

--The railroad round trip, with empty return, TOFC variable operating costs are estimated to be slightly more than three-fourths of the current TOFC single car published tariff rate between Salinas and Chicago.

--TOFC Plan III is the alternative that more closely approximates the needs of the shippers and receivers for a supplemental shipping program.

--The comparative shipping costs for perishables from the Salinas and San Francisco Bay areas to Chicago are as follows:

	Cost per <u>40,000 pounds</u>
Truck <u>1/</u>	\$1,760.00
Mechanical refrigerated car	
50,000-pound rate <u>2/</u>	\$2,371.90
80,000-pound rate <u>2/</u>	2,876.90
<u>3/</u> \$1,897.52	
<u>3/</u> 1,438.50	
Plan III TOFC (Single car rate) <u>4/</u>	
100 percent empty return	\$1,745.20
50 percent empty return	1,560.45
25 percent empty return	1,469.57
Plan III TOFC (2,500 trailer annual volume rate) <u>4/</u>	
100 percent empty return	\$1,687.70
50 percent empty return	1,518.45
25 percent empty return	1,434.07

1/ Based on average weekly truck rate quotations, December 1977 through April 1978.

2/ Includes \$236.90 mechanical refrigeration charge.

3/ Prorated to 40,000 pounds.

4/ Includes pickup and delivery, administrative and trailer costs of door-to-door service.

Based on an analysis of the alternatives studied and considering the worsening shortages of transportation equipment, current truck rates, the outlook for the future, and the established study objectives, we recommend that the grower-shipper group complement the present truck transportation system by initiating Plan III, shipper controlled, TOFC shipping program organized and operated as follows:

--Organize a shippers association and set up under 402(c) of Part IV of the Interstate Commerce Act with provisions for obtaining member investment and borrowed capital. 2/

--Initially serve the Chicago market only and operate a minimum number of trailers to be obtained as follows:

- a. Arrange with a trailer contracting company, or
- b. Lease new or used equipment.

--Obtain firm commitments for use of program from shippers, railroads, and receivers.

--Arrange with trucking firm in the market area to provide delivery services and develop backhauls.

--Establish a maintenance program for day-to-day upkeep of trailers and equipment including:

- a. Maintenance contracts for trailers and refrigeration equipment.
- b. Association-operated program to provide pretrip inspection and cleaning.

--Utilize a slip sheet unit loading program for mechanical handling.

After a reasonable trial period, if operating results and business growth warrant, the trailer fleet can be expanded and additional markets served.

2/ While the farmer cooperative exemption in Sec. 203 (b)(5), Part II of the ICC Act would appear to be the logical section of the Act to organize under, it is too restrictive as it limits backhaul tonnage for nonmember nonfarmers to 15 percent.

PIGGYBACKING FRESH VEGETABLES

California to Midwest and Northeast

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For the past several years there has been a decline in the number of mechanical refrigerated cars available for hauling produce from California to the Midwest and Northeast. In addition, requirements of receivers for fast, dependable service in smaller trailerload lots have tended to make the mechanical refrigerated car obsolete for transporting lettuce, celery, and other fresh vegetables from California.

About three-fourths of all lettuce shipments from California to midwestern and eastern cities now move by truck. Periodic shortages of trucks, increasingly higher truck fuel, maintenance, and equipment replacement costs have caused concern among California vegetable shippers regarding the possible implications of their growing dependence on this one mode of transportation. This shipper concern over the growing dependence on trucks and the rapidly declining role of rails in serving distant markets leads to exploration of alternate transportation programs to provide needed service and help maintain competitive balance between modes.

SHIPPING PATTERNS AND REQUIREMENTS

Data on number, sizes, origins, destinations, and seasonality of vegetable shipments were obtained from 14 California grower-shippers for the years 1975 and 1976. Information was also obtained from principal receivers in midwestern and northeast markets on their needs, requirements and constraints in receiving and handling fresh produce from California. Additional data on transportation equipment and transit times were obtained from selected carriers and from secondary sources.

The following ESCS staff members assisted with this report: Earl B. Miller, Martin A. Blum, and Richard Berberich, who aided with analyses; and James R. Baarda, who prepared information on organization and legal considerations. Ronald P. Vail of Agricultural Marketing Service assisted in field work and obtained transportation rate and cost information.

Shipments--California to the Midwest and Northeast

The 14 grower-shippers moved more than 10.8 million cartons of vegetables to midwestern and eastern destinations in 1975 and 12.2 million cartons in 1976. About 95 percent was lettuce. Trucks that hauled less than half of the shipments in 1975 accounted for about two-thirds of the volume in 1976. For detailed data see tables 1 and 2 in the Appendix.

Appendix tables 3 and 4 list 62 destination cities in the Northeast and Midwest for 1975 and 1976. Shipments to cities within about 50 miles of the 62 cities listed were combined and are included in the city total shown. One-fifth or 12 of the 62 cities accounted for two-thirds of the total volume shipped during 1975 and 1976.

The 12 principal destination cities in the Midwest and Northeast and the average annual receipts for 1975 and 1976 are shown in table 1. These cities would be the principal candidates for piggyback terminal points.

We compared the 1975-76 average shipments of lettuce by the participating California shippers to the total unloads of lettuce reported by USDA for the same period in 17 cities in the Midwest and East. As shown in table 2, the percentage distribution of volume among cities for both the Midwest and East is quite comparable. This would indicate that the distribution pattern for the 14 California grower-shippers is generally representative of the industry as a whole.

Seasonality

The heavy shipping months for the 14 California fresh vegetable grower-shippers were from May through September (table 3). About 60 percent of a year's total shipments occurred during this 5-month period.

While May through September were the heaviest shipping months, a substantial movement of over 500,000 cartons or 500 carload equivalents occurred in each of the remaining 7 months of the year.

For detailed information by months for 1975 and 1976, see appendix tables 1 and 2.

Rail Versus Truck

There has been a dramatic decline in rail shipments of produce from California and Arizona to midwestern and eastern destinations in recent years. This is illustrated in table 4 which shows rail and truck shipments of lettuce from California and Arizona to selected eastern and midwestern cities for 1975, 1976, and 1977.

As shown in the table, railroads' share of the lettuce shipments to eastern and midwestern cities dropped from 54 percent in 1975 to 30 percent in 1977. Trucks captured the railroads' loss, increasing their share from 46 percent in 1975 to 70 percent in 1977.

Data obtained from the 14 California grower-shippers in our study show the same trend to trucks as for all shippers (see table 4). Following is the percentage of the shipments moving by rail and truck for the 14 study shippers compared with all shippers to 17 eastern and midwestern cities in 1975-76.

Table 1--Principal destination in the Midwest and Northeast for produce from 14 California shippers, average 1975-76

Destination	: Average receipts 1975 and 1976
	<u>Cartons</u>
New York	1,579,488
Boston	1,119,931
Philadelphia	934,618
Chicago	721,872
Cleveland	551,276
Pittsburgh	533,576
Cincinnati	463,754
Detroit	458,882
Washington	386,712
St. Louis	311,767
Indianapolis	277,317
Buffalo	257,144

Table 2--Comparison between shipments of lettuce by 14 California shippers and total U.S. shipments to 17 eastern and midwestern cities, average for 1975-76

Destinations	Shipments from			
	14 California shippers		Total United States 1/	
	Carload equivalents	Percent	Carload equivalents	Percent
Eastern				
Albany	126	3	468	2
Balti-Washington	431	9	2,095	11
Boston	851	18	3,487	18
Buffalo	251	5	940	5
New York	1,457	30	6,635	35
Philadelphia	1,073	22	3,323	17
Pittsburgh	514	11	1,845	10
Providence	111	2	330	2
Total Eastern	4,814	100	19,123	100
Midwestern				
Chicago	707	23	3,794	26
Cincinnati	421	14	1,384	9
Cleveland	513	17	1,828	12
Detroit	377	12	2,467	17
Indianapolis	250	8	807	6
Louisville	96	3	652	4
Milwaukee	166	6	521	4
Minneapolis	211	7	1,557	11
St. Louis	302	10	1,639	11
Total Midwestern	3,043	100	14,649	100
Grand total	7,857		33,772	

1/ Fresh Fruit and Vegetable Unloads, AMS, USDA, FVUS 1 & 2, 1975 and 1976.

Table 3--Seasonality of shipments of produce by 14 California shippers, average for 1975-76

Month	: Average shipments 1975 and 1976
	: <u>Cartons</u>
January	598,382
February	630,342
March	602,066
April	578,420
May	1,516,391
June	1,649,079
July	1,285,859
August	1,156,133
September	1,318,918
October	921,175
November	709,617
December	<u>537,699</u>
Total	11,504,081

Table 4--Total rail and truck shipments of lettuce from California and Arizona to 17 eastern and midwestern cities, 1975-77 1/

Destinations	Year	Rail		Truck	
		Carload	Percent	Carload	Percent
		equivalents:		equivalents:	
8 Eastern cities	1975	11,861	62	7,248	38
	1976	7,891	41	11,242	59
	1977 2/	6,848	34	13,100	66
9 Midwestern cities	1975	6,118	44	7,917	56
	1976	4,646	30	10,613	70
	1977 2/	4,257	26	12,385	74
Total 17 cities	1975	17,979	54	15,165	46
	1976	12,537	36	21,855	64
	1977 2/	11,105	30	25,485	70

1/ Fresh Fruit and Vegetable Unloads, AMS, USDA, FVUS, 1 & 2, 1975-77.

2/ Preliminary.

	1975		1976	
	Rail	Truck	Rail	Truck
	Percent		Percent	
All shippers	54	46	37	63
14 study shippers	54	46	36	64

Transportation Equipment

The present number, types, and availability of transportation equipment will influence the type and extent of any alternative transportation program that may be developed for hauling produce. Similarly, new types and concepts of rail and truck equipment, either now becoming available or in the planning stage, need to be considered and evaluated.

Supply and Availability

The number of insulated and mechanical refrigerated cars owned and controlled by the railroads has remained fairly constant since 1973. According to the Association of American Railroads (AAR) following are the numbers of cars that were in service as of January 1, 1972, through 1976.

Railroad Cars Owned or Leased and in Service, 1972-76

Year	Insulated	Mechanical refrigerated	Total
1972	3,817	5,489	9,306
1973	3,155	9,688	12,843
1974	2,618	9,704	12,322
1975	4,126	9,620	13,746
1976	3,613	9,259	12,872

The number of railroad owned and controlled refrigerated piggyback trailers has declined dramatically since 1973. Railroad-owned TOFC insulated trailers are now in such short supply that the Interstate Commerce Commission recently issued Service Order No. 1328 calling for their prompt return to the L&N Railroad, the RF&P Railroad and the SCL Railroad. This order was initiated to help the melon, potato, and other perishable shippers in the Southeast.

The AAR shows the following numbers of railroad owned, leased and/or controlled refrigerated trailers as of January 1, 1972 through 1978.
(Fruit Growers Express and Pacific Fruit Express trailers not included.)

Year	Refrigerated trailers
1972	9,141
1973	9,194
1974	8,481
1975	6,565
1976	4,431
1977	2,809
1978	2,441

The AAR also shows the following numbers of in-service flatcars available for TOFC on January 1, 1972 through 1978.

Year	Railroad owned	Privately owned	Total
1972	7,886	26,596	34,482
1973	8,397	28,245	36,642
1974	10,618	30,362	40,980
1975	6,918	38,460	45,378
1976	6,677	39,548	46,225
1977	5,885	39,140	45,025
1978	5,819	39,864	45,683

These numbers include, under the private ownership column, Trailer Train's fleet of flatcars. They also include equipment leased by the railroads.

With the sharp drop in recent years of railroad owned and controlled refrigerated trailers and flatcars, it is apparent that any TOFC shipping program based on the use of railroad equipment would face serious problems when it comes to equipment availability.

New Types and Concepts

The TOFC and Container on FlatCar (COFC) programs have grown at a very rapid rate in recent years. During the first 12 weeks of 1978 TOFC/COFC volume was up 24.2 percent over the same period in 1976. ^{3/} However, we should add that during this same period, food and kindred products have shown a decrease and now comprise less than 1 percent of all intermodal traffic.

^{3/} Railway Age, Apr. 23, 1978, pp. 27-28.

This rapid total overall growth has stimulated a great deal of activity in research and development. Currently there are several new systems now being tested or on the drawing boards.

Some of the new designs include the configurations shown in figure 1.

The Santa Fe Railroad has tested its Six-Pack and is now building 10 sets of the larger Ten-Pack units. This is a new design which permanently ties 6 or 10 lightweight articulated cars together. The Ten-Pack can carry 10 trailers of any overall length of from 40 to 45 feet.

The Bi-Modal Corporations new Road-Railer, which is capable of highway travel on rubber tires and rail travel on a built-in set of rail wheels, is another new concept. The Paton low-profile railcar system has a potential for improving line haul movement of trailers. Trailer Train is also experimenting with a two-unit prototype car.

Innovations in piggyback terminal operations and handling systems are also being examined at this time.

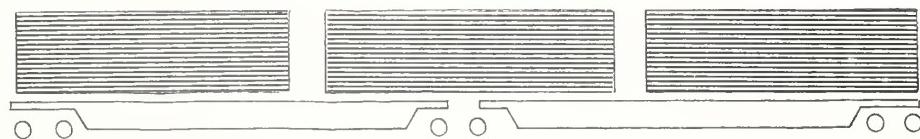
The Federal Railroad Administration (FRA) in August of 1977 awarded contracts to two consulting firms to evaluate the various new systems and concepts that show promise for the future. These evaluations have been completed and in April 1978 the FRA published an Executive Summary with recommendations for a detailed assessment of those systems that show the greatest promise.

The two study teams actually evaluated more than 100 innovative concepts for improving the present TOFC/COFC system.

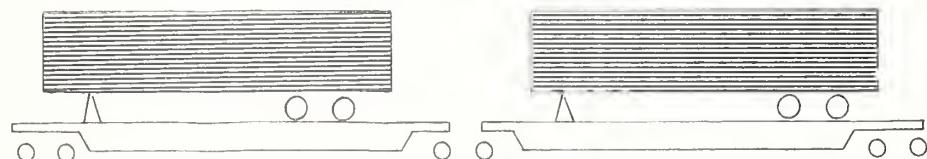
Overall, in evaluating the economic advantages and disadvantages of the present TOFC system versus common carrier trucks, researchers found there were no differences in costs in pickup and delivery. In line haul costs there is a strong economic advantage with the intermodal. They also found a slight advantage in service times (point to point) with intermodal dedicated trains on the longer hauls. However, they found no advantage in service times in mixed trains. In terms of terminal handling, the common carrier truck has a clear advantage over intermodal.

One major conclusion of the study is that improvements in terminal operations would significantly improve service and reduce costs. Another is that on hauls of more than 900 to 1,000 miles, intermodal service can compete profitably with common carrier trucks.

Figure 1 – Two- section dual purpose articulated car COFC/TOFC design

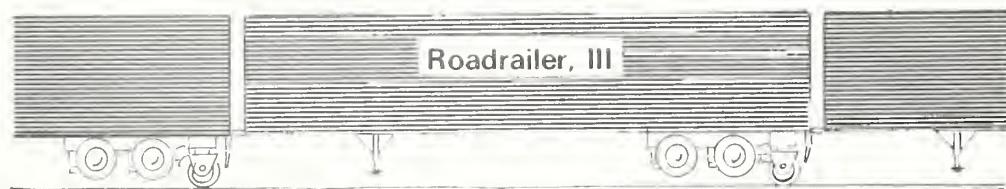
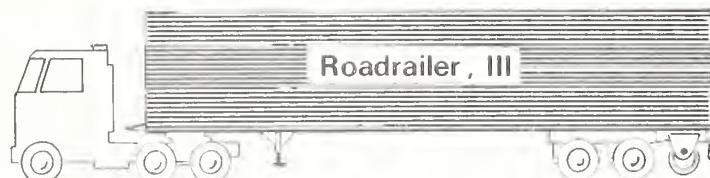


Three 40 - foot containers



Two 45 - foot trailers

Bi-modal roadrailer



Whether this same relationship would result when an intermodal system for produce is compared with exempt trucking is debatable. However, we believe the study findings in the areas of pickup and delivery costs, transit times by type of train, and competitiveness of the two modes according to length of haul would also be valid.

Consideration of new TOFC systems and equipment comes at a time when the produce industry is facing some hard decisions. Although the railroad-owned fleet of insulated and refrigerated cars has remained fairly constant at around 13,000 since 1973, fewer have been used for hauling produce.

There are several reasons for this trend. Based on interviews with both shippers and receivers, we feel the major reason is the failure of the railroads to provide consistent, reliable delivery. Sometimes a railroad would provide fifth-day delivery for California produce in New York and at other times it would take twice that long. Another reason is the railroads' incentive rates for heavier loading that tend to divert the cars to products like potatoes. The greater volume required to fill a railcar virtually eliminates its use for all but the largest receivers. Also important is the practice by the receivers of obtaining mixed loads of several different products from more than one shipper. With truck or piggyback this is not a problem as the driver can pick up at more than one origin point and still have the load on its way the same day. This cannot be done with railcars because of the switching problems. For these reasons many shippers consider the refrigerated railcar obsolete.

The fact that a well organized piggyback program would resolve most of the above-mentioned problems makes it quite attractive. Any new type of equipment that might be developed to improve transit times would add to that attractiveness.

Meeting Shipper and Receiver Needs

A major requirement of any piggyback program is meeting shipper and buyer needs. If the service is not reliable or the produce is not delivered in reasonable time the program will fail. Thus, we attempted to obtain detailed information on rail transit times and reliability.

Transit Times

Based on current schedules and interviews with railroad officials, single cars with two trailers should be able to meet the following operating times with the indicated degree of reliability:

Western Pacific Railroad Company

Oakland to Chicago - operates daily

Cutoff time for loading

10:00 p.m.

Arrival in Chicago (third evening)

10:45 p.m.

Available in Chicago(off ramp - on the ground)	Midnight
Total time, cutoff to availability in Chicago	74 hr.
Percent reliability (plus or minus 30 min.)	90 percent

Southern Pacific Transportation Company

Oakland to Chicago - operates daily	
Cutoff time for loading	10:30 p.m.
Arrival in Chicago (third morning)	8:45 a.m.
Available in Chicago	11:00 a.m.
Total time, cutoff to availability in Chicago	60 1/2 hr.
Percent reliability (plus or minus 2 hr.)	90 percent

The Atchinson Topeka and Santa Fe Railway Company

Richmond or Fresno to Chicago - operates daily	
Cutoff time for loading	9:00 p.m.
Arrival in Chicago (fourth morning)	2:45 a.m.
Available in Chicago	4:45 a.m.
Total time, cutoff to availability in Chicago	79 hr. 45 min.
Percent reliability (plus or minus 5 hr.)	79 percent

Consolidated Rail Corporation (Conrail) 1/

Chicago to Harrisburg - operates daily	
Cutoff time for switching	8:00 p.m.
Arrival in Harrisburg (next day)	11:25 p.m.
Available in Harrisburg (next day)	7:00 a.m.
Total time, cutoff to availability in Harrisburg	35 hr.

Chicago to Syracuse - operates daily	
Cutoff time for switching	9:30 p.m.
Arrival in Syracuse (next day)	9:55 p.m.
Available in Syracuse (next day)	8:00 a.m.
Total time, cutoff to availability in Syracuse	34 1/2 hr.

Chicago to New York - several operate daily	
Cutoff time for switching	11:00 p.m.
Arrival in New York (second day)	7:45 a.m.
Available in New York	9:00 a.m.
Total time, cutoff to availability in New York	34 hr.

Chicago to Boston - operates daily	
Cutoff time for switching	9:00 p.m.
Arrival in Boston (second day)	8:10 a.m.
Available in Boston	9:30 a.m.
Total time cutoff to availability in Boston	36 hr.

1/ Harrisburg and Syracuse were recommended by Conrail officials as preferable deramping points to serve eastern markets.

The reliability of Conrail service from Chicago to the East is currently estimated at between 40 and 50 percent measured against plus or minus 2 hours. Last winter, with the added problems of snow and ice, few if any of their trains were running on time. Conrail officials are aware of their serious schedule problems and expect some major improvements by mid-1979.

Presently, at both Harrisburg and Syracuse, the trains arrive before midnight but there are no night operations and the trailers are not available until morning. A delay of up to 6 hours in train arrival time at their terminals would not affect trailer availability.

Service Reliability

In our discussions with receivers we found that they almost always considered reliable service more important than speed or cost. If given the choice of third morning delivery with a 75 percent on-time arrival reliability factor or a slower third evening delivery with 95 percent on-time arrival, the choice was for the higher dependability of arrival time.

As for cost of service, receivers accept the fact that at times during late fall or early spring when there are more trucks available than produce, exempt truck rates will be lower than TOFC rates. However, what seems more important to them is that during the heavy shipping period the lower TOFC summer rates balance out the overall yearend total cost.

Fresh produce requires both rapid and reliable delivery. The reason for this is simple from a retailer's point of view -- the customer insists on fresh, attractive produce. When the receiver can depend on arrival times, a fresh shipment will arrive just before the last carton is sold from the previous shipment. If this doesn't happen, it means the retailer will either be out of stock or be forced to increase his inventory, which reduces the freshness of his produce, and increases his losses from spoilage.

To be successful, an intermodal program must meet high standards of service and reliability. This has been confirmed time and again. Two recent studies are the National Intermodal Network Feasibility Study, dated May 1976, prepared for the U.S. Department of Transportation's Federal Railroad Administration; and the Produce Distribution Study prepared for the Federal Railroad Administration and the U. S. Department of Commerce's National Bureau of Standards. 4/

That the railroads have capability to provide fast, reliable service is not questioned. They have proved it by past performance. What is required is a mutual and firm commitment by the railroads to provide that service and a commitment by shippers and receivers to use it.

4/ Report No. FRA OOPD-78-2. Part of a Long-Term Study of Produce Transportation, Manalytics, Inc., San Francisco, December 1977.

RAIL AND TRUCK SERVICE AND COSTS

We discussed previously the relative importance of rail and truck transportation in the movement of California produce to midwest and northeast markets. In the discussion that follows we present comparative services and costs for the two transportation modes.

Present Trucking System

The typical truck used for long distance movement of produce from California is a tractor-semitrailer combination. The semitrailer is generally a two-axle, insulated van with a nose mount refrigeration unit. Load capacity is 40,000 pounds.

There is little information available on ownership of trucks used in hauling California produce to market. An estimate of produce market share by type of trucking operation was recently made in the above-mentioned study conducted by Manalytics.

The following information was obtained from unpublished backup data developed by Manalytics for its summary report, table 5.

Table 5--Estimates of produce market share by type of trucking operation

Type of Operation	:	Percent of produce traffic carried	:	Produce as a percent of total traffic carried
For hire:				
Regulated		35		15
Nonregulated ^{1/}		35		45
Private		10		35
Independent owner-operators ^{2/}		20		50

^{1/} Includes fleets under the control of truck brokers.

^{2/} Includes a few small fleets, the criterion being whether the fleet owner regularly drives one of the vehicles.

Regardless of the percentages of produce shown here as carried by the several categories of truck operations listed, the important factor is that any trucker can haul produce in interstate commerce without operating authority from the Interstate Commerce Commission (ICC).

Section 203(b)(6) of Part II of the Interstate Commerce Act exempts from economic regulation trucks engaged in hauling unmanufactured agricultural commodities such as produce as long as nonexempt commodities are not carried in the same truck at the same time.

Freight rate schedules or tariffs are not required to be filed with the ICC on exempt commodities carried by trucks in interstate commerce. Thus truck rates on California produce destined to Midwest and Northeast markets are negotiated and can vary considerably during the year depending largely on supply and demand for trucks.

Charges to Midwest and Northeast

As there are no rate tariffs or other published rate schedules that must be used and applied for interstate truck movements of produce it is difficult to obtain accurate truck rate information. We obtained weekly truck rate quotations for the period from May 1975 through April 1978 from records of Pacific Fruit Express Company, Western District, Salinas, Calif. The rates apply from the Salinas area to Chicago, Detroit, Philadelphia, Boston, and New York.

Contract or agreed-upon rates between shippers, truckers, and receivers for actual shipments may vary from the quoted rates. However, we believe these rates are representative of what trucks were charging on the dates quoted. A detailed list of the rates obtained is shown in table 5 of the Appendix.

Figures 2 and 3 show the cyclical pattern of truck rates on produce for each of the past 3 years from California to Chicago and New York. Generally, rates are highest during the period from June through September--the heavy lettuce shipping period--and lower during the winter and spring months.

Service to Midwest and Northeast

The service advantage of trucks in produce hauling is the most important consideration in evaluating or developing alternative systems for moving fresh vegetables from California. Following are major service advantages of trucks hauling produce to midwest and northeast markets from California:

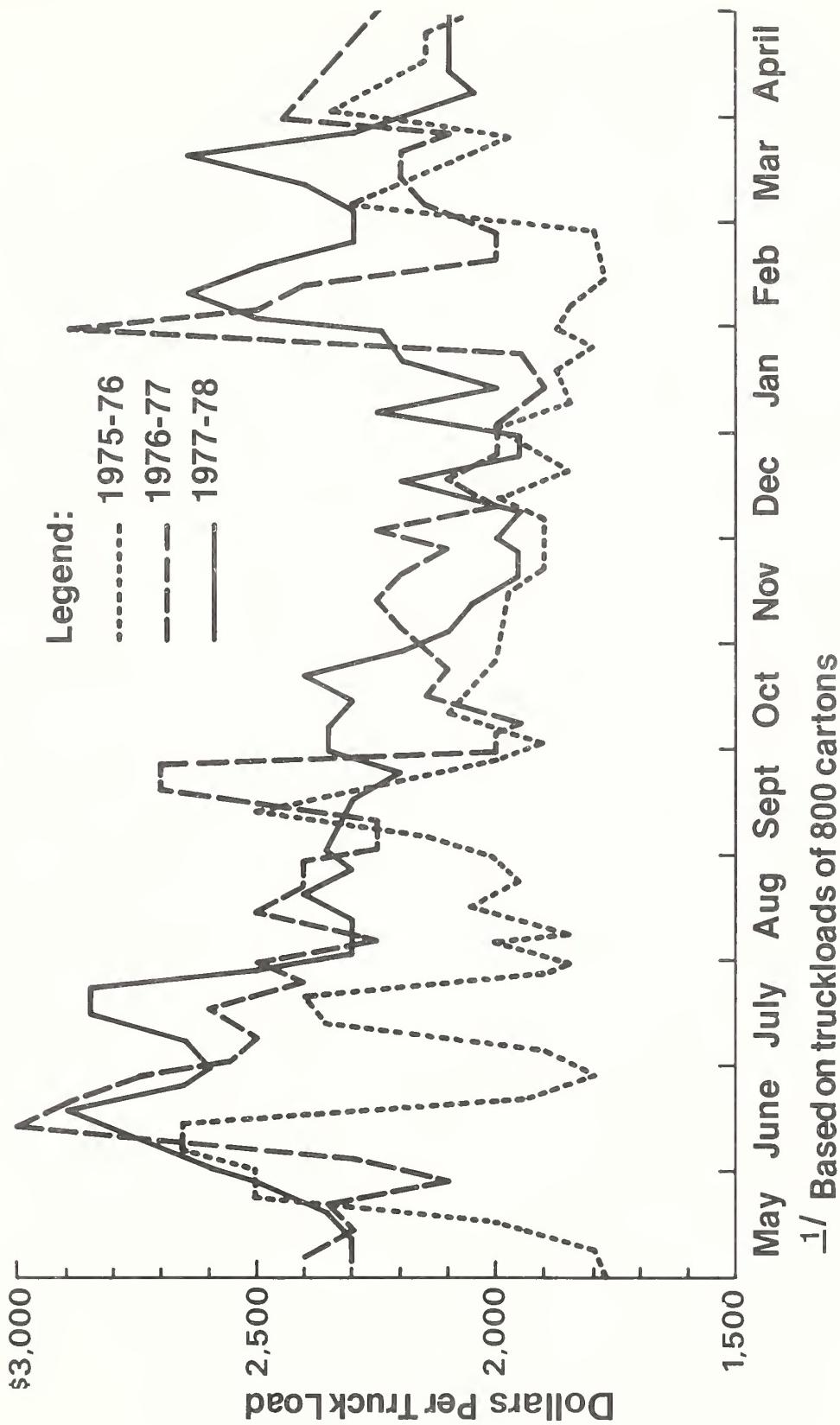
- Multistop pickups to assemble mixed loads.

- Faster transit times--generally third morning delivery in Chicago, fourth morning delivery in New York City.

- More reliable and predictable delivery times.

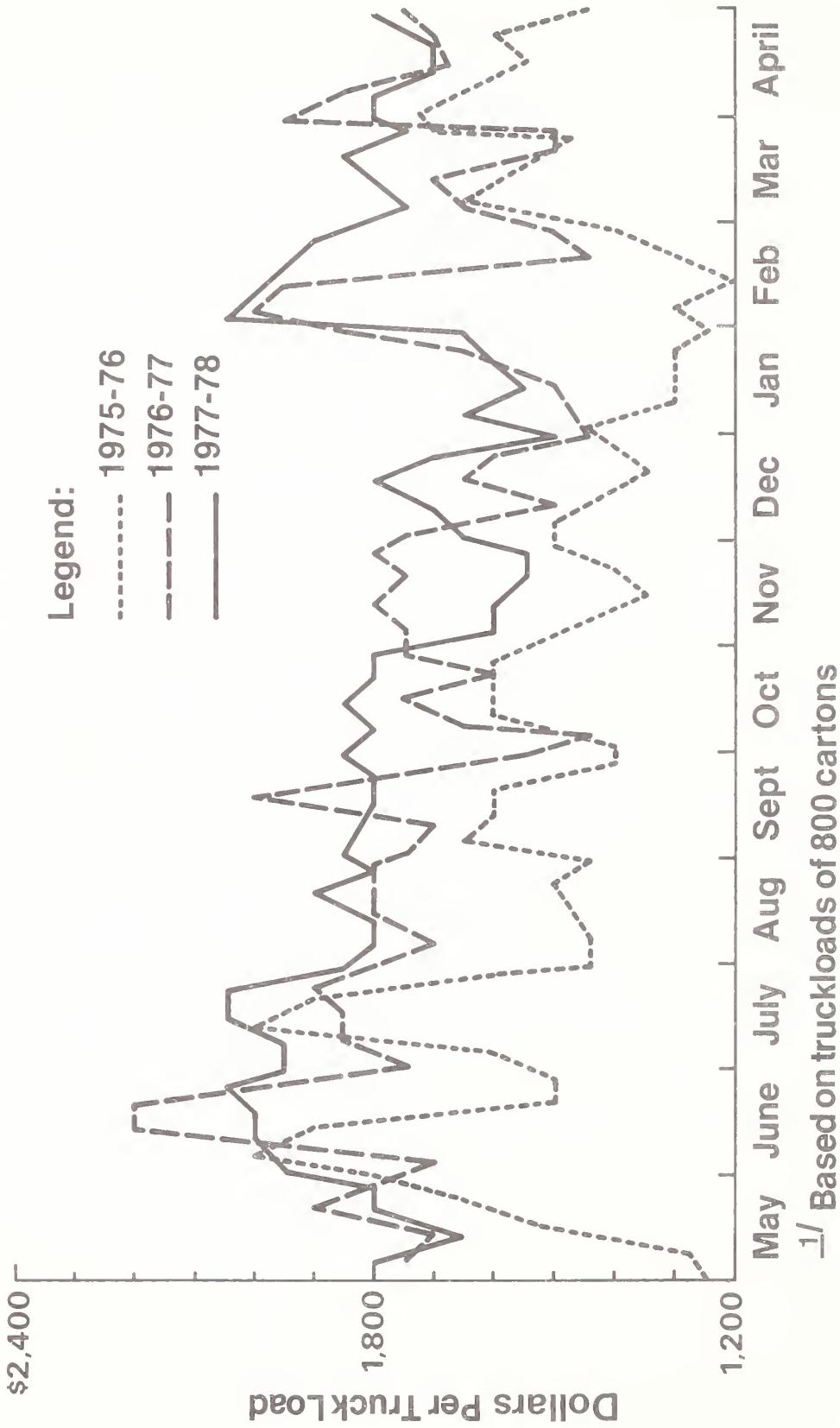
- Smaller volume loads--40,000 pounds for trucks versus 50,000 to 80,000 pounds for rail.

Figure 2 - Average weekly truckload rate quotations $\frac{1}{4}$ for produce from Salinas, Calif., to New York City, last 3 years



Source: Records of Pacific Fruit Express Company, Salinas
Based on daily truck quotations reported by shippers.

Figure 3 - Average weekly truckload rate quotations $\frac{1}{\text{carton}}$ for produce from Salinas, Calif., to Chicago, last 3 years



Source: Records of Pacific Fruit Express Company, Salinas
Based on daily truck quotations reported by shippers.

Providing multistop pickups to assemble mixed loads is an increasingly important truck advantage, according to officials of the four major grocery chains interviewed. They said mixed loads ranged from a low of 72 percent of total receipts for one chain to a high of 90 percent for another.

The short shelf life of most fresh vegetables means it is vital to time arrivals in the market area to coincide with weekend specials and sales promotion periods. Fast transit time plus reliability and greater predictability of arrival times for trucks have created stiff competition for railroads.

Present Rail System

As stated earlier, the use of rail service for shipping perishable produce has been declining rapidly. It is apparent that if this trend is to be reversed, it must be done in a manner that will mutually benefit receivers, shippers, and carriers.

Types of Service Used

There are basically three types of equipment to choose from in shipping perishable produce by rail. They are: (a) The ice bunker insulated car, (b) the mechanical refrigerated car, and (c) the mechanical refrigerated piggyback trailer.

According to the AAR, in the early 1950's railroads (including private ownership) had more than 100,000 ice bunker cars in service. By 1976 the mechanical refrigerated car had become popular and it represented 76 percent of the refrigerated car fleet. However, the total fleet by 1976 amounted to only 34,000 cars, a drop of almost 70,000 cars between 1954 and 1976.

Of the total 34,000 refrigerated cars, the railroads owned less than 13,000 or about 38 percent as of January 1, 1976.

Since 1974 the railroad-owned fleet of refrigerated trailers has been declining at an average of 1,510 trailers a year, and as of January 1, 1978, railroads owned just 2,441 mechanically refrigerated trailers for TOFC service.

Table 6--Shipping rates and charges by rail from Salinas and/or San Francisco Bay area for mechanical refrigerated cars and TOFC to selected areas, June 1978

<u>----- Unit -----</u>	<u>-----Dollar per-----</u>	
Mechanical refrigerated car	<u>100 lbs.</u>	<u>Car</u>
To Chicago		
50,000-pound rate	\$4.27	\$2,135.00
80,000-pound rate	3.30	2,640.00
Refrigeration charge		236.90
To Syracuse, Harrisburg, and New York		
50,000-pound rate	\$5.89	\$2,945.000
80,000-pound rate	4.70	3,760.000
Refrigeration charge		278.30
Plan II (Railroad-owned trailers with door-to-door service)		
	<u>100 lbs.</u>	<u>Trailer</u>
To Chicago		
38,000-pound rate	\$5.03	\$1,911.40
76,000-pound rate	4.71	1,789.80
(There are no Plan II rates published beyond Chicago)		
Plan II 1/4 (Railroad-owned trailers with pickup and delivery provided at one end only)		
	<u>100 lbs.</u>	<u>Trailer</u>
To Chicago		
80,000-pound rate	\$4.19	\$1,676.00
To Syracuse, Harrisburg, and New York		
80,000-pound rate	\$4.95	\$1,980.00
Plan III (Shipper-owned trailers with ramp-to-ramp service)		
	<u>100 lbs.</u>	<u>Trailer</u>
To Chicago		
80,000-pound rate	\$1.99	\$ 791.00
Empty return		369.50

Rail Operating Costs

To better understand the total cost picture of the TOFC system, we ran estimated variable costs on trainload quantities, 10-car blocks, 5-car blocks, and single cars. The basic cost data were obtained from the Interstate Commerce Commission's Rail Form A and were updated to June 30, 1978. The data from Salinas to Chicago, Harrisburg, and Syracuse on train makeup, crew changes, train miles, locomotive power required, and operating times for a typical train were provided by the railroads.

Estimated railroad variable costs are ramp-to-ramp and are based on two trailers per flatcar, each loaded with 45,000 pounds one way and returning empty. The trainload cost data are for a train of 45 flatcars with 90 trailers each carrying 45,000 pounds one way and returning empty.

Detailed estimated costs for single car operations are in appendix table 6 and for 45-car trains in appendix table 7.

Note that costs shown in appendix tables 6 and 7 are variable costs. The variable costs shown may be as much as 80 percent of full costs, including fixed costs. We have not estimated full costs as management decisions are involved as to what and how much should be included. However, it should be pointed out that any revenue received by the railroad above variable costs will be compensatory and will help cover fixed costs that include return on investment. Anything over full costs would be pure profit.

Table 7 summarizes costs for several different TOFC configurations from Salinas to Syracuse, Harrisburg, and Chicago.

Although these costs were run using a 45,000-pound load per trailer, the maximum gross weight limit for Illinois and Indiana is 73,280 pounds. Any deliveries or moves within these States would limit the loading to between 41,000 and 42,000 pounds depending on the amount of fuel carried and the tare weight of the tractor and trailer. For our study, the following weights were used:

	<u>Pounds</u>
Load	45,000
Trailer tare weight	14,675
Diesel fuel (trailer)	<u>770</u>
Subtotal	60,445
Tractor	15,250
Fuel (tractor)	<u>1,200</u>
Subtotal	16,450
Total	<u>76,895</u>

Table 7--Estimated round trip railroad variable costs with empty trailer return

	: Per car	: Per trailer
Salinas to Chicago		
Unit train	\$1,578.77	\$ 789.39
Single car	1,775.11	887.56
5-car block	1,755.00	877.50
10-car block	1,746.00	763.00
Salinas to Harrisburg		
Unit train		
Rail interchange	2,182.33	1,091.16
Single car		
Rail interchange	2,428.32	1,214.16
Rubber interchange ^{1/}	2,752.14	1,376.07
5-car block		
Rail interchange	2,403.00	1,201.50
Rubber interchange	2,736.00	1,368.00
10-car block		
Rail interchange	2,394.00	1,197.00
Rubber interchange	2,727.00	1,363.50
Salinas to Syracuse		
Unit train		
Rail interchange	2,161.04	1,080.52
Single car		
Rail interchange	2,383.01	1,191.51
Rubber interchange	2,706.83	1,353.42
5-car block		
Rail interchange	2,358.00	1,179.00
Rubber interchange	2,691.00	1,345.50
10-car block		
Rail interchange	2,349.00	1,174.50
Rubber interchange	2,682.00	1,341.00

^{1/} Refers to unloading the trailer from a flatcar and moving it by highway to another railroad where it is reloaded onto a flatcar.

Most States, except for a few Midwestern States and Pennsylvania, can take a full 45,000-pound load. With restrictions in Illinois and Indiana the maximum produce load would be 41,385 pounds. However, an additional 1,000 pounds could be loaded if the fuel tanks were only half filled between the offload ramp and the delivery point.

By comparing our estimated TOFC ramp-to-ramp variable costs with current Plan III tariff rates, we find the following:

Salinas or San Francisco Bay Area to Chicago

Per Trailer

Estimated round trip cost of single car with empty return	\$ <u>887.56</u>
Current tariff - Loaded direction	791.00
Empty return	<u>369.50</u>
Total	<u>1,160.50</u>
Difference, for covering fixed cost and profit	\$ 272.94

The Santa Fe Railroad currently has a Plan III TOFC rate in effect covering a minimum annual movement of 1,250 flatcars (2,500 trailers) to Chicago as follows:

Per Trailer

Loaded direction	\$ 764.50
Empty return	<u>338.50</u>
Total	\$1,103.00

Any backhaul movement would reduce the cost of the round trip. However, it would slow turnaround time, which would increase the number of trailers required and also increase the total investment. If any of these backhauls terminated at a point other than Salinas or the San Francisco Bay Area, it would involve an expensive repositioning charge. If both the front and backhaul were on the same railroad, it would be possible to work out a lower repositioning charge.

The ideal operation would include a committed arrangement for backhaul into the Bay Area with a small group of shippers, shippers' associations, or freight forwarders. Railroads have indicated they would assist in putting the Salinas grower-shipper group in contact with westbound shippers in Chicago so arrangements could be made.

Considering the volume of freight moving west to the Bay Area from Chicago, it is our opinion that backhauls can be arranged for the majority of return trips.

If 50 percent of the returns had backhauls, it would reduce backhaul cost by half and in effect the return of two trailers (one loaded and one empty) would cost \$369.50 or \$184.75 each at the current tariff and \$169.25 at the 1,250 car rate. Thus the average round trip tariff cost would be \$975.75 at the single car rate and \$933.75 at the volume rate.

Before these rates can be compared to the door-to-door rates of the mechanical refrigerated cars or independent trucks, all costs of trailers and service beyond the ramp must be added.

Monthly Trailer Cost

Average trailer lease	\$260.00
Trailer maintenance contract	52.00
Refrigeration unit maintenance contract	25.00
Average monthly pretrip expense	<u>37.50</u>
Subtotal	\$374.50

10 percent bad order	37.45
Fuel @ \$3.00 per day average	<u>91.00</u>
Subtotal	\$502.95
Administration @ 10 percent	<u>50.30</u>
Total per month	\$553.25

Average trailer cost per day \$ 18.20

Estimated Total Plan III Cost
San Francisco Bay Area to Chicago

Cost per Trailer

	Single car	1,250 Car
Trailer cost \$18.20 x 21 days round trip	\$382.20	\$382.20
Plan II present tariff loaded direction	791.00	764.50
Empty return	369.50	338.50
Pickup cost Salinas to Bay Area ramp	137.50	137.50
Delivery cost beyond ramp to Chicago		
Commercial zone 1/	<u>65.00</u>	<u>65.00</u>
Total 100 percent empty return	\$1,745.20	\$1,687.70
50 percent empty return	1,560.45	1,518.45
25 percent empty return	1,469.57	1,434.07

1/ See table 8 for delivery costs beyond the Chicago Commercial Zone.

Any improvement in the estimated 21-day turnaround time would reduce total cost by \$18.20 for every day less than the 21-day turnaround time.

Plan III costs compare very favorably with the average, December 1977 through April 1978, weekly truck rate quotations of about \$1,760. Plan III costs would show an even greater advantage for piggyback during the heavy shipping periods, primarily during the summer when trucks are scarce and rates are high.

Table 8--Example of truck delivery charges from rail ramp to points within and outside the Chicago Commercial Zone

<u>Destination</u>	<u>: Charge 1/</u>	<u>: Round Trip mileage 2/</u>	<u>: Cost Per mile</u>
Chicago commercial zone ^{3/}	\$ 65.00	N.A.	\$N.A.
Altoona, Pa. ^{4/}	725.00	1,086	.67
Akron, Ohio	490.00	693	.70
Baltimore, Md.	725.00	1,356	.53
Battle Creek, Mich.	350.00	324	1.08
Detroit, Mich.	475.00	532	.89
Grand Rapids, Mich.	375.00	344	1.09
Flint, Mich.	500.00	526	.95
Toledo, Ohio	415.00	466	.89
Cleveland, Ohio	500.00	672	.74
Columbus, Ohio	475.00	622	.76
Cincinnati, Ohio	475.00	574	.83
Youngstown, Ohio	625.00	792	.79
New York, N.Y.	925.00	1,594	.58
Newark, N.J.	925.00	1,558	.59
Hartford, Conn.	1,025.00	1,774	.58
Harrisburg, Pa.	875.00	1,298	.67
Philadelphia, Pa.	925.00	1,498	.62
Pittsburgh, Pa.	640.00	904	.71
Green Bay, Wis.	400.00	394	1.02
Ft. Wayne, Ind.	375.00	318	1.18
Boston, Mass.	1,040.00	1,936	.54
Buffalo, N.Y.	775.00	1,048	.74
Louisville, Ky.	475.00	580	.82
Peoria, Ill.	375.00	310	1.21
St. Louis, Mo.	500.00	570	.88
Providence, R.I.	1,025.00	1,916	.53
Rockford, Ill.	325.00	170	1.91
Scranton, Pa.	850.00	1,382	.62
Albany, N.Y.	925.00	1,608	.53
Syracuse, N.Y.	750.00	1,338	.56

1/ Charges do not include unloading. If trucker must pay an unloading charge he bills the charge back to the shipper.

2/ From Household Goods Mileage Guide No. 11.

3/ Delivery within the Chicago commercial zone includes pickup of loaded trailer at railroad ramp and delivery to consignee's ramp; from that point, pickup of empty trailer at consignee's ramp and delivery to westbound shipper's ramp.

4/ Delivery outside Chicago commercial zone includes pickup of loaded trailer at railroad ramp and delivery to consignee's ramp; from that point, pickup of empty trailer at consignee's ramp and delivery to westbound shipper's ramp in Chicago.

PROPOSED RAIL TOFC PROGRAM

While there are several rail TOFC programs available to shippers, we selected Plan II 1/2 and Plan III to discuss and evaluate. These are the logical plans for California produce shippers to consider in developing an intermodal system.

Plan II 1/2

TOFC Plan II 1/2 has the railroad furnishing both trailers and flatcars and is basically a ramp-to-ramp service. Empty trailers must be picked up at the rail carrier's loading ramp by the shipper, taken to be loaded, and returned to the loading ramp. The consignee must receive loaded trailers at the rail carrier's ramp, pull them to his place of business, unload the freight and return empty trailers to the ramp.

Railroad charges for providing line haul from origin to destination ramps are included in the published tariffs. In operation, shippers often arrange for the originating and delivering railroads to provide local pickup and delivery service through the rail carriers subsidiary or trucking department at locally quoted rates. Comparative advantages and disadvantages of Plan II 1/2 to produce shippers are as follows:

Advantages

- Railroad makes investment in trailers.
- Railroad investment increases commitment to service.
- Railroad maintains equipment.
- Damage to lading resulting from faulty equipment is railroad responsibility.
- Railroad accepts problems of obtaining backhauls and overall equipment utilization.
- Railroad responsible for repositioning trailers for reloading.

Disadvantages

- Little, if any, assurance that sufficient trailers will be available when needed.
- Lack of shipper control over maintenance program.
- Difficulties for shippers in collecting damage claims.

Plan III

TOFC Plan III is widely used. Under this plan the railroad owns only the flatcars, and the shippers own the trailers. As in plan II 1/2 it is the shippers' responsibility to provide for local pickup and delivery service. Rates for the railroad's ramp-to-ramp haul are published in the tariff, usually at a base rate per shipment up to a certain weight and so much per hundredweight for the balance.

Shippers wishing to use Plan III service can provide trailers from their own fleet, obtain them from a leasing company, contract for the service or, in some instances if they are available, lease them from the railroad on a per trip basis. Comparative advantages and disadvantages of Plan III are as follows:

Advantages

- Shipper control and a planned supply of equipment.
- Controlled maintenance program.
- Trailers designed and built to shippers' specifications with reverse air flow, high cube, and unitized loading capabilities.

Disadvantages

- Shipper commitment to capital outlay or long-term lease.
- Difficult to bind railroads to commitment.
- Shipper responsible for obtaining backhauls.
- Difficult to control timely unloading of trailers on return haul.
- Shipper responsible for maintenance programs.
- Need for professional management of trailer fleet.
- Need for expeditors and other specialized personnel to obtain best utilization of trailers.

Applicability to Needs of Shippers and Receivers

The TOFC program more nearly approximates the present and future needs of both shippers and receivers than any other service offered by the railroads. However, the mechanical refrigerated car will continue to be used to serve large receivers as long as the equipment is available.

It is clear, based on discussions with shippers and receivers, that the need for (1) fast, frequent and dependable service, (2) multiple pickups at origin to assemble mixed loads of produce (one chain store official said that 90 percent of its loads are now mixed), and (3) flexibility in delivery of smaller trailer loads at destination demands greater emphasis on TOFC by railroads if they are to remain in the produce hauling business. The question is which TOFC plan--Plan II 1/2 or III--offers the greatest potential for implementation and use by the produce industry.

We are not convinced that railroads will make the necessary investment in trailers to meet future needs of shippers interested in using TOFC service. For this and other reasons--which we will discuss later in this report--we will concentrate our analysis on the feasibility of a Plan III piggyback program.

Obtaining Trailers for TOFC Program

Operating a Plan III piggyback program requires the operator, in this case the shipper, to obtain a fleet of trailers of the type, size and number sufficient to provide the service needed. The number of trailers required and comparative costs of alternative means of trailer lease or purchase are the components that must be analyzed before a piggyback program of the type and size needed can be recommended.

Size of Fleet Needed

The 14 shippers in the study averaged 16,324 rail and truck shipments per year for 1975 and 1976 to points on the Mississippi River and east. Assuming an average 3-week turnaround per trip, each trailer could make 17 trips a year. Sixty percent of the year's total shipments occur in the 5 months from May to September. To handle this peak volume would require a total of 1,371 trailers. In actual operation the number required would be greater due to variations in daily and weekly peak demands.

If trailers were acquired for the peak 5-month movement, then during the 7 slower months there would be utilization problems with excess trailers. From October through April average demand for trailers is only 653, thus if 1,371 were acquired for the peak period, 718 trailers would be surplus for 7 months. Rental cost of these trailers would create a prohibitive financial burden. For purposes of this report we are using 800 cartons as a load. However, during 1975 and 1976 the 14 shippers moved 32,649 loads with a total of 23,008,159 cartons, at an actual average of 705 cartons per load.

It is not suggested that trailers be acquired for the total peak period or even for the minimum shipping period. Any sound program

should start out on a test basis with a selected market and be gradually expanded as problems are worked out and experience gained.

Solutions to the uneven shipping flow could include acquiring enough trailers to cover the present truck portion to selected markets only for the minimum shipping periods, supplementing the fleet during the heavy shipping months with railroad equipment, and by using independent truckers. Another alternative would be to work out an agreement with shippers of other products whose peak movement runs from November to April. An example would be to exchange equipment with potato growers in the Red River Valley of Minnesota and North Dakota.

With this type of arrangement a back-to-back lease could be worked out for the 6-month winter period when California produce shipments are low and Red River Valley potato shipments are high. This would help assure a greater percentage of trailer availability during the peak periods and at the same time provide a means of covering trailer costs during the balance of the year.

In operation, a combination of both plans would undoubtedly provide the most satisfactory solution to the problem.

To calculate the minimum and maximum number of trailers required for any destination, we used the 1976 year high and low season totals for the city shown in appendix table 4 and divided that figure by 800 to determine the number of trailer loads per year.

Using this system and considering only the portion presently shipped by truck, the 12 cities listed would require the following number of trailers:

City <u>1/</u>	Number of trailers	
	Minimum <u>2/</u>	Maximum <u>2/</u>
New York	46	98
Philadelphia	33	69
Boston	27	56
Chicago	20	42
Cleveland	23	49
Pittsburgh	26	55
Washington, D. C.	25	38
Cincinnati	16	34
Detroit	15	32
St. Louis	9	19
Minneapolis	15	32
Miami	<u>12</u>	<u>26</u>
Total	267	550

1/ These cities represent two-thirds of the total 1976 shipments for the area from the Mississippi River eastward.

2/ Maximum column indicates the number of trailers required during the heavy shipping period, minimum column applies for the light shipping period.

Thus, about 267 trailers would be needed to provide service to the 12 cities from the 14 shippers in our study. As stated previously, this would not provide enough equipment for the peak shipping period of May through September but would be generally adequate for the other 7 months of the year.

Options Available for Obtaining Trailers

There are three primary options available for obtaining a fleet of TOFC trailers:

1. Contract or negotiated agreement.

This would involve a working arrangement with an organization or contractor such as a trucking company, cooperative, railroad, or supplier of railroad equipment who would be willing to purchase or lease trailers for an assured return on its investment. Advantages of this type of arrangement would be the built-in professional management and established trailer tracking system of the contractor. It

would also relieve the shippers of the need for expediteds and freight solicitors to arrange backhauls and rapid return of the trailers. In addition, it would eliminate the need for large capital investment.

A disadvantage would be the added expense of providing the contractor with a reasonable return on his investment. However, in the long run this may be less expensive than it would at first appear since a good established tracking system and a professional management team could reduce equipment requirements to a minimum.

2. Direct purchase.

Assuming all economies of scale are equal for volume purchasing, and ample financing is available at reasonable rates, it is usually better from an economic standpoint to buy trailers than lease them. The reason is simple--the lessor must include a profit margin on his lease rates and that profit margin is additional cost that the lessee would not incur if he owned rather than leased the trailers.

Disadvantages would include:

Obtaining and tieing up the capital needed for trailer purchase.

Possibility of equipment obsolescence.

Responsible for major repairs and maintenance.

3. Leasing.

Any organization must watch its cash position and leasing is one way to preserve cash for other revenue generating activities.

Some of the other advantages of leasing include:

a. Investment tax credit (ITC) fruit and vegetable marketing--cooperatives do not normally generate "net income"; therefore, they are unable to fully utilize the 10 percent ITC. It can be arranged for the leasing company to take the ITC, then pass it on in the form of lower lease rates.

b. Budgeting strategy is simpler in that cash flow is fixed with no abrupt replacement costs to ruin projected budgets.

c. Nationwide maintenance programs are offered by some leasing companies that provide repair and/or replacement services in all major U.S. cities.

d. Volume purchasing and disposal of used equipment can usually be handled better through a leasing company that is set up to take advantage of market changes.

Comparative costs of leasing versus buying can perhaps best be determined by a present-value cash flow analysis.

To illustrate the use of present-value cash flows in our decisionmaking process, we have devised a hypothetical situation. Cash outflow of our alternatives happens at different times over the life of the trailers, thus making it necessary to utilize present-value. The example analysis shows the present value of a \$120,000 trailer investment utilizing equity financing (table 9), debt financing (table 10), and lease financing (table 11). The assumptions are that there is a 10 percent discount rate, a 5-year projected life, a 7 percent prime rate (cost of debt), and cash receipts and expenses are equivalent for all the alternatives. No consideration was given to ITC, and it was assumed that buying power would be roughly equivalent.

The result of present-value cash outflow shows that debt financing is the least costly alternative, lease financing next, and equity financing the most expensive. These calculations show the strictly quantitative side of the lease-or-buy decision.

We have found that leasing in general will cost a little more. However, if a lease is carefully selected and tailored to need, the additional cost will buy an equivalent value in improved cash flow, debt equity ratio, or in a nationwide maintenance program.

Table 9-- Ownership present-value cash flow utilizing equity

Item	:	Present value	:	Year 1	Year 2	Year 3	Year 4	Year 5
Purchase		-\$120,000						
Profit on sale 1/							\$24,000	
10% present-value discount							.620	
Present-value		-\$120,000						\$14,880
Total cash outflow								-\$96,000
Present-value of cash outflow								-\$105,120

1/ Estimated at 20%.

Note: Investment--\$120,000.
 60-month life--no book residual
 Tax exempt cooperative.
 All funds paid or received at end of year.
 Outright purchase--no financing (equity financing).

Table 10--Ownership present-value cash flow utilizing debt

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Debt retirement	-\$24,000	-\$24,000	-\$24,000	-\$24,000	-\$24,000
Interest	-10,500	-8,400	-6,300	-4,200	-2,100
Profit on sale 1/					24,000
Annual cash outflow	-\$34,500	-\$32,400	-\$30,300	-\$28,200	-\$2,100
10% present-value discount	.909	.826	.751	.683	.620
Present-value	-\$31,360	-\$26,762	-\$22,755	-\$19,261	-\$1,302
Total cash outflow					-\$127,500
Present-value of cash outflow					-\$101,440

1/ Estimated at 20%.

Note: Purchase--Financed at 7% with 20% compensating balance.

Effective Interest Rate - 8.75%. Principal amortized 20% annually.

Table 11--Lease present-value cash flow analysis

Item	Year 1	Year 2	Year 3	Year 4	Year 5
Lease cost	-\$35,006	-\$32,875	-\$30,686	-\$28,512	-\$25,920
Less: Profit on sale 1/					24,000
Annual cash outflow	-35,006	-32,875	-30,686	-28,512	-\$1,920
10% present-value discount	.909	.826	.751	.683	.620
Present-value	-\$31,820	-\$27,155	-\$23,045	-\$19,474	-\$1,190
Total cash outflow					-\$128,999
Present-value of cash outflow					-\$102,684

1/ Estimated at 20%.

Note: Cost of equipment--\$120,000.

60-month lease.

Lease cost based upon 7% prime rate.

All funds paid or received at end of year.

Present-value of 60-month lease on \$120,000 equipment value with 20% recovery on original investment.

Types and Sizes of Trailers

Determining the trailer size to recommend is particularly difficult. Of concern is the height of the trailer. We are convinced, after talking with larger receivers and others with experience in unitized handling systems, that future shipping programs will count heavily on handling efficiencies of unit loading and unloading with 40" x 48" (102 x 122 cm.) slip sheets.

To mechanically load and unload, a trailer height of 13 feet, 6 inches is desirable. Anything less than this will cut down on the available cubic volume of the trailer and also subject the roof to possible damage from the masts of the lift trucks while loading and unloading. This will also require trailer doors that open flush with the inside width and height of the door opening.

The problem with the 13 foot, 6 inch trailers is that there are many areas in the east where overhead clearance is insufficient. Chicago has several overpasses too low; the same is true of metropolitan New York, Philadelphia, and Baltimore, including the Baltimore Tunnel. We also found that there is at least one large grocery chain warehouse that cannot accommodate 13-foot, 6-inch trailers as they will not clear below the door opening.

Despite these problems we still feel that the benefits to be gained from using the higher cube trailers, both on the primary and backhaul, more than offset the problems that will be created. Working with reliable truckers, on local deliveries who will select routes to avoid low overpasses will greatly reduce the danger of damaging the trailers.

Our next serious concern was the length of the trailer. We believe a high cube trailer that can be mechanically unloaded and loaded is required. A 40-foot trailer, for example, can take only 18 of the commonly used 40" x 48" pallet units if loaded mechanically with a straight-in pattern. In addition, it requires bracing or blocking by hand.

A 42-foot trailer on the other hand provides enough extra length to take a full 20-pallet load and does not require hand blocking. This extra cube capacity is desirable if the trailers are loaded with a backhaul.

In our discussions, freight forwarders and other potential users of westbound trailers stressed that rental agreements and freight tariffs favor heavier loads. Therefore, the 40-foot refrigerated trailers with their lower cubes are used only when none of the higher cube general purpose trailers are available.

The problem with 42-foot refrigerated trailers, however, is loading them on flatcars. The standard flatcar is designed to take two 40-foot trailers with nose mount refrigeration units. By modifying the flatcars and relocating the stanchions, a trailer up to 45 feet can be loaded in combination with one 40-foot trailer.

In most of the larger shipping centers there are enough 40-foot trailers moving to facilitate prompt loading of a combination of 40-foot trailers with 42- or 45-foot trailers. Therefore, combining different trailers in the East for the westbound move does not pose a significant problem.

The difficulty comes in trying to match the two sizes on the eastbound move from growing areas such as Salinas, Fresno (Santa Fe), El Centro, Blythe, and Yuma. At the time of this report there weren't enough 40-foot trailers moving by TOFC from these areas to match the larger trailers with an equal number of smaller ones.

This problem could be partially overcome out of Salinas by pulling the trailers to the Bay area (Oakland or Richmond) for loading on flatcars. By taking the trailers to the Bay Area rather than loading them in Salinas, there would be an added cost for pulling the trailers to Oakland (\$137.50 versus only \$40 per round trip at the Salinas ramp). However, there are advantages to be gained by going to Oakland or Richmond that may offset the additional expense. Advantages would include: (a) opportunity to select from a greater number of carriers; (b) later cutoff times for the Southern Pacific; (c) truck tractors could bring back empty trailers on their return trip.

At the time of this study the Southern Pacific had a published rate of \$560.96 for moving two trailers, loaded or empty, on a flatcar from Oakland to Salinas. Considering the rate for an empty return from Chicago to Salinas of \$739 per flatcar with two trailers, the cost from Oakland to Salinas seems high.

Based on the difficulties of matching two trailer sizes on each flatcar and the scarcity of flatcars that have been converted to handle the trailers, we would recommend using 40-foot trailers for a Plan III piggyback program. Experimental trips could be made mixing 42 1/2-foot and 40-foot trailers to see if there were operating problems.

The ideal trailer for existing flatcars would have a minimum inside length of 40 feet, 11 inches. It would allow the full 20-unit loading pattern and still fit two trailers on a car. In our discussions with trailer manufacturers and suppliers we found one major manufacturer who said they have developed a new design that will enable two of the longer, higher cube refrigerated trailers with belly mounts to be loaded on a standard flatcar.

As this was outside the scope of our study and time did not permit, we did not evaluate the design. However, we believe any proposed program involving the use of piggyback trailers warrants consideration and investigation of this or any other new design.

Trailer Refrigeration Equipment

For trailer refrigeration equipment, there are two options from which to select. These options are the nose mount and the belly mount compressor units. 5/ Additionally one can choose between a standard airflow and a reverse airflow system. The following list of advantages and disadvantages given for nose mount and belly mount units is based on information obtained from receivers, railroads, trailer owners, and other users.

Nose Mount

Advantages

- Better resale value.
- Above dirt, ice, and rocks thrown up by wheels during highway use.
- Fewer moving parts.

Disadvantages

- Inefficient cooling on flat cars while en route.
- More difficult to inspect while on flatcars.
- Susceptible to damage during terminal operations.

Belly Mount

Advantages

- Easier to work on
- Provides for more inside loading area
- Less chance of overheating during terminal operations.

Disadvantages

- Approximately 600 pounds heavier.
- Longer cooling and electrical connecting lines.
- Approximately \$1,500 more expensive than nose mount unit.

Selecting the Unit--For highway movement we would recommend the nose mount refrigeration unit as it avoids problems encountered by the belly mount unit of dirt, ice, and rocks being thrown from the road into the unit. This is not a problem in a TOFC program.

Advantages of the belly mount are: (a) Easier maintenance and inspection, particularly aboard a flatcar; (b) higher inside cube available; and (c) better cooling capability.

5/ Nose mount refrigeration unit is located on the outside, upper front of the trailer. Belly mount refrigeration unit is located on the outside, bottom of the trailer.

There are problems with nose mount units in piggyback service. In transit, the airflow goes over the top of the first trailer, bypassing the cooling unit of the second trailer, thus reducing its cooling capability. With the nose mount there is also the possibility of trailers being parked nose-to-nose at rail loading ramps. The units may then overheat as hot exhaust air from one unit is blown into the other. Also, if the trailers are parked at ramps with the front of one trailer near the tail of another, the nose mount unit can be damaged when the front trailer is raised and hooked to the tractor.

Based on the preceding comments and the extensive operating experience of Fruit Growers Express, we recommend use of belly mount refrigeration units with fueling capability from either side.

Concerning the standard airflow refrigeration unit versus the reverse airflow system, we recommend the latter. With standard airflow, cold air is blown over the top of the load and cools it while circulating downward. After reaching the floor, the return air passes the temperature sensor on its way back to the cooling unit.

During the operating cycle, if the temperature sensor on the air return indicates the load should be cooled down, the compressor starts the cooling cycle. Then the top half of the load may be cooled below the specified temperature, even to the point of freezing, while the warmer bottom half of the load would cause the air return sensor to continue the cooling cycle. By time the air return sensor indicates a temperature low enough to shut down the cooling cycle, excess cooling of the top half of the load may cause the heating cycle to come on, causing wide swings in temperature.

With a reverse or bottom airflow system the fan is reversed and the return air comes in from the top of the load past the cooler unit, then past the temperature sensor, and on through the load by way of the floor. Temperature is always measured after the air passes the cooling and heating units and before it reaches the load. By sensing airflow temperature before it reaches the load, the possibility of overcooling (freezing) or overheating is virtually eliminated.

Comparative Trailer Cost

We requested price quotations on purchasing or leasing trailers from four major leasing companies and manufacturers. In general, the prices quoted below are given as a range only, since each manufacturer has his own package that he feels is best suited for the service.

Price of a trailer ranging from 13 feet to 13 feet, 6 inches in height and 41 feet, 9 inches to 43 feet in length, with a belly mount unit, will vary from \$24,357 to \$27,550. Prices in most cases were in effect as of June 1978. The variation in prices is due largely to construction and equipment differences among the trailers. Principal equipment variations that affect price include: Type of refrigeration unit, trailer dimensions, type of floor and lining, and type and amount of insulation.

Prices have been going up rapidly, and with one company there have been at least two increases since the first of the year. Firm prices cannot be determined without a specific negotiation on a fixed package with a delivery date determined. Some manufacturers are now quoting for fourth quarter or later delivery.

Lease cost of trailers ranges from \$226 a month for a 10-year lease to \$291.95 for an 8-year lease. Lease quotations are based on the leasing company taking the investment tax credit and passing it on in the form of lower payments. Again the actual lease should be negotiated based on a specific package. The package would include not only equipment specifications but also such things as financial responsibility of the lessee and trial periods to test the program and/or escape clauses.

Trailer Maintenance

A full maintenance program contract including tires (not including refrigeration equipment) would cost about \$52 per month for a maximum of 5,000 miles per year.

A refrigeration unit maintenance program can be obtained for \$0.48 an operating hour. Based on a one-way haul from Salinas to Chicago with the unit operating 40 percent of the time and a 21-day turnaround, the cost would average about \$15 a trip, or \$20 to \$25 per month depending on turnaround time. The total maintenance program, if contracted out, would be \$72 a month for each trailer.

Fruit Growers Express, with its large fleet, found that under normal conditions each of its maintenance men can pre-trip about 10 trailers a day including the belly mount refrigeration units. If other services are to be performed, they require additional time.

A 1,200-hour check, for instance, will take 20 to 30 hours and calibrating a thermostat will take 1 1/2 hours each. However, if two or more units are parked side by side, the calibration may run concurrently. Replacing or repairing tires, changing oil, and washing also require additional time.

We would like to reemphasize that one of the most important items in any TOFC program for produce is a sound maintenance program. For the refrigeration units to function properly they must be maintained and kept clean. If the coils and/or condenser are dirty they lose their efficiency and trouble will result.

Organizing to Operate

Setting up an organization to transport or arrange for transportation of goods in interstate commerce will require familiarity with the regulatory statutes. Several exemptions are discussed

that may be available for the TOFC system recommended. No legal conclusions should be drawn from them, however. Early guidance by a knowledgeable attorney is essential in this specialized area.

Agricultural producers shipping their products in interstate commerce have three exemptions from transportation economic regulation available. First is the agricultural cooperative exemption in Part II of the Interstate Commerce Act of 1887 (Part II was added in 1935 and applies to motor carriers). Second and third are exemptions from regulation as freight forwarders in Part IV of the Act (Part IV was added in 1942). Background is given in National Motor Freight Traffic Association v. United States, 253 F. Supp. 661 (D.D.C. 1966)). Section 402(b) of Part IV applies to agricultural cooperatives and section 402(c) applies to shippers associations. A properly organized and operated agricultural cooperative can fit any of these three exemptions, with the choice depending on the system's needs compared with advantages or disadvantages of each exemption.

Under Part II, Interstate Commerce Act

Section 203(b) of Part II (49 U.S.C. section 303(b)) lists a number of exemptions from Part II requirements relating to certificates of public convenience and necessity for motor carriers and to other regulation of motor carriers under Part II. Exemption of section 203 (b) states that:

"Nothing in this chapter, except the provisions of section 302 of this title relative to qualifications and maximum hours of service of employees and safety of operation or standards of equipment shall be construed to include... (5) motor vehicles controlled and operated by a cooperative association as defined in the Agricultural Marketing Act, approved June 15, 1929, as amended, or by a federation of such cooperative associations, if such federation possesses no greater powers or purposes than cooperative associations so defined, but any interstate transportation performed by such a cooperative association or federation of cooperative associations for members who are neither farmers, cooperative associations, nor federations thereof for compensation, except transportation otherwise exempt under this chapter, shall be limited to that which is incidental to its primary transportation operation and necessary for its effective performance and shall in no event exceed 15 per centum of its total interstate transportation services in any fiscal year, measured in terms of tonnage: Provided, that, for the purposes hereof, notwithstanding any other provision of law, transportation performed for or on behalf of the United States or any agency or instrumentality thereof shall be deemed to be transportation performed for a nonmember: Provided further, That any such cooperative association or federation which performs interstate transportation for nonmembers who are neither farmers, cooperative associations, nor federations thereof, except transportation otherwise exempt under this chapter, shall notify the Commission of its intent to perform such transportation prior to the

commencement thereof: And provided further, That in no event shall any such cooperative association or federation which is required hereunder to give notice to the Commission, transport interstate for compensation in any fiscal year of such association or federation a quantity of property for nonmembers which, measured in terms of tonnage, exceeds the total quantity of property transported interstate for itself and its members in such fiscal year..."

The Agricultural Marketing Act of 1929, as amended, (12 U.S.C. section 1141j) from which the basic cooperative definition is drawn reads as follows:

"The term 'cooperative association' means any association in which farmers act together in processing, preparing for market, handling, and/or marketing the farm products of persons so engaged, and also means any association in which farmers act together in purchasing, testing, grading, processing, distributing, and/or farm business services. Provided, however, that such associations are operated for the mutual benefit of the members thereof as such producers or purchasers and conform to one or both of the following requirements:

"First. That no member of the association is allowed more than one vote because of the amount of stock or membership capital he may own therein; and

"Second. That the association does not pay dividends on stock or membership capital in excess of 8 per centum per annum.

"And in any case to the following:

"Third. That the association shall not deal in farm products, farm supplies, and farm business services with or for nonmembers in an amount greater in value than the total amount of such business transacted by it with or for members. All business transacted by any cooperative association for or on behalf of the United States or any agency or instrumentality thereof shall be disregarded in determining the volume of member and nonmember business transacted by such association."

Regulations issued by the ICC further define the limits of the exemption, practices within those limits (49 C.F.R. sections 1047.20 - 1047.23 and proposed regulations in 43 Fed. Reg. pp. 2396-2400 (Jan. 17, 1978)). Growth of a few "sham" cooperatives that are not true agricultural cooperatives but who try to come within the exemption has forced the Commission to become more stringent in the administration of these regulations. However, legitimate agricultural cooperatives should have no difficulty meeting the requirements.

Possible makeup of association membership in the proposed system makes one requirement in the definition of an agricultural cooperative particularly important: To qualify for the exemption, all members must be farmers. Presence of any nonfarmer members will destroy the exemption.

In addition, restrictions on transportation by qualified agricultural cooperatives are important to note. The cooperative is not permitted to transport more (by tonnage) for nonmembers than for members. The cooperative is also limited to 15 percent of its transportation for nonmembers who are not agricultural producers, and such transportation must be incidental to its primary transportation operation. These specific restrictions must be added to the requirements for true cooperative operation.

The agriculture cooperative exemption Sec. 203(b)(5) Part II of the ICC Act would be ideally suited for organizing, if it were not so restrictive. The cooperative exemption, in limiting the non-member nonexempt volume, restricts the possibility of obtaining backhauls of general commodities to only 15 percent. This limitation forces the shippers to return trailers empty at considerable expense and wasted energy.

Under Part IV, Interstate Commerce Act

Part IV of the Interstate Commerce Act deals with freight forwarders. Freight forwarders are defined in the Act to mean any person, including an association, other than a Part I common carrier, that:

"...holds itself out to the general public as a common carrier to transport or provide transportation of property, or any class or classes of property, for compensation, in interstate commerce, and which, in the ordinary and usual course of its undertaking, (a) assembles and consolidates or provides for assembling and consolidating shipments of such property, and performs or provides for the performance of break-bulk and distributing operations with respect to such consolidated shipments, and (b) assumes responsibility for the transportation of such property from point of receipt to point of destination, and (c) utilizes, for the whole or any part of the transportation of such shipments, the services of a carrier or carriers subject to..." other parts of the Act.

Freight forwarders are required to obtain a permit to operate and are subject to ICC regulation. Two types of organizations, however, are exempt from Part IV regulation. One is an agricultural cooperative defined by the same statute referred to in Part II. That exemption is found in section 402(b)(29 U.S.C section 1002(b)).

"The provisions of this chapter shall not apply (1) to service performed by or under the direction of a cooperative association, as defined in the Agriculture Marketing Act, approved June 15, 1929, as amended, or by a federation of such cooperative associations, if such federation possesses no greater powers or purposes than cooperative associations so defined..."

The requirement of total farmer membership remains the same as in the Part II exemption.

The second Part IV exemption is not restricted to farmer cooperatives and is available for use by an association whose members are nonfarmers or, of course, a mixture of farmers and nonfarmers. The exemption is found at 49 U.S.C. section 1002(c) and is called the section 402(c) exemption. It reads:

"The provisions of this chapter shall not be construed to apply (1) to the operations of a shipper, or a group or association of shippers, in consolidating or distributing freight for themselves or for the members thereof, on a nonprofit basis, for the purpose of securing the benefits of carload, truckload, or other volume rates, or (2) to the operations of a warehouseman or other shippers' agent, in consolidating or distributing pool cars, whose services and responsibilities to shippers in connection with such operations are confined to the terminal area in which such operations are performed."

This provision (specifically subsection (1)) appears to fit the needs of the grower-shipper group. In addition, it permits flexibility in the membership required by the nature of prospective participants in the recommended system. Because the grower-shipper group may find Part IV of particular use, the ICC and the courts should be carefully considered.

Part IV applies only to freight forwarders. Features of such a function are outlined below. A shippers' association must have certain characteristics to be exempt from freight forwarder regulations. Those are discussed briefly. Also, comments are made on the typical operation of such an association and the formalities of organization.

The first requirement for Part IV treatment is that the activities of an individual or association actually are those of a freight forwarder. The statute quoted lists three requirements: Clause A describes the overall pattern of freight forwarding. Clause B specifies that the freight forwarder takes the responsibility for transporting goods from the initial point of receipt to the final destination. Finally, clause C requires that a common carrier be used for some part of the transportation from origin to destination.

A typical freight forwarding operation is described by the District Court in National Motor Freight Traffic Association v. United States, 253 F. Supp. 661 (D.D.C. 1966).

"Freight forwarders collect and consolidate less than carload or less than truckload shipments and secure common carrier transportation for the long haul movement of property owned by individual shippers by carload or truckload. In accomplishing this, the forwarder consolidates several small, less than truckload shipments into a full truckload or carload quantity which then moves over the major portion of the journey by common carrier at the lower truckload or carload rate. In reality what may appear as a single

operation actually involves three distinct phases, each phase involving a different common carrier. First the goods of each individual shipper are carried to a central consolidation point. Second, the aggregated property then is transported over the line haul by a common carrier to a break-bulk or distribution point; and finally, the goods are moved from the distribution center to the various ultimate consignees. Without the intervention of the forwarder each small individual shipper would be required to deal with the several carriers involved, paying each carrier the more expensive less-than-truckload or less-than-carload rate for the entire movement from pick-up point to the final delivery point. The freight forwarder offers the shippers a more expeditious, comprehensive transportation service at a lesser cost. The details of arranging transportation are completely cared for by the forwarder and some savings are passed on to the shipper through the differential between full capacity truckload and carload rates over the line haul and the more expensive less-than-truckload or less-than-carload rates over the line haul."

Conditions listed in the statute are not mere suggestions for convenient operation. They are legal requirements. Each condition must be separately satisfied before Part IV can be used.

An association acting as a freight forwarder must perform at least the essentials of functions described in clause A. A forwarder that operated at a single terminal point did not qualify because it did not perform enough of those essential functions (National Motor Freight Traffic Association v. United States, 242 F. Supp. 601 (D. D. C. 1965)). A shippers association may arrange with agents to perform certain of the functions (Columbia Shippers and Receivers Association v. United States, 301 F. Supp. 310 (D. Del. 1969)). A shippers association may utilize terminals at the point of origin and the destination of the shipment and not be subject to regulation. Also, the agencies that provide for the assembly, consolidation and distribution of the small shipments are not carriers requiring licenses (Gilbert Carrier Corporation v. Receivers and Shippers, Inc., 350 F. Supp. 1119 (C. D. Cal. 1972)). Under some circumstances members themselves may perform some of the functions (National Motor Freight Traffic Association v. United States, 205 F. Supp. 592 (D. D. C. 1962)).

The true freight forwarder also must assume responsibility for the transportation. An association that does not take that responsibility from point of receipt to point of destination cannot qualify as a freight forwarder (National Motor Freight Traffic Association v. Delaware Valley Freight Terminal, 323 I.C.C. 560 (1963), aff'd, National Motor Freight Traffic Association v. United States, 242 F. Supp. 601 (D. C. 1964)).

Finally, the freight forwarder must use a common carrier for part of the transportation. In one case an association that consolidated shipments but transported them in its own leased vehicles to the final destination was held not to be a freight forwarder (I. C. C. v. International Shippers Association of New Jersey, Inc., 249 F. Supp. 66 (D. N. J. 1965), Aff'd, 363 F. 2d 878 (3d. Cir. 1966)).

Shipper's Association Requirements

When the basic requirements for coverage as a Part IV freight forwarder are met, the exemption for Part IV regulation extends to those shippers' associations that meet 402(c)(1) statutory requirements. It should be noted that 402(c) is a "clarifying" provision rather than a true exemption from Part IV regulation. The definition of freight forwarder includes only those persons who offer themselves to the general public to transport or provide transportation as described in the statute. A shippers' association does not in fact do this but serves only its members for their benefit. As stated in the House Committee on Interstate and Foreign Commerce Report No. 1172:

"The definition of freight forwarder includes only those persons who hold themselves out "to the general public" to transport or provide transportation of property for compensation, and only those who, in the ordinary and usual course of their business, perform or provide the performance of both the assembling and concentrating operations and the break-bulk and distributing operations in the through movement of property, and only those who assume a common-carrier responsibility for the transportation and safety of the property from point of receipt to point of destination."

"The definition therefore draws a line of distinction which clearly excludes brokers, nonprofit associations of shippers, warehousemen, and pool-car operators, as those persons normally operate, since such persons do not do all of the things required under the definition to constitute a freight forwarder. In order to make absolutely sure, however, that the definition cannot by construction be held to cover shippers, groups of shippers, and nonprofit associations of shippers, consolidating or distributing freight for themselves or their members, or to cover warehousemen, pool-car operators, and other shippers' agents engaged in consolidating or distributing pool cars, and not assuming responsibility for the through movement of the property, subsection (c) was included in this section."

Physical operators cannot distinguish between a regulated freight forwarder and an unregulated shippers' association. The distinguishing features are found in the relationship between the organization and those with whom it deals. The ICC in Atlanta Shippers Association--Investigation of Operations, 322 I. C. C. 273 (1964), said

"In order properly to pinpoint those considerations determinative of the status under part IV of a given transportation operation actually conducted by a self-styled shippers' organization, the

functional similarities and differences between the services provided by a forwarder and the operations of a lawful nonprofit group or association of shippers need to be noted. Thus, both the freight forwarder and a shippers' association lawfully operating under the provisions of section 402(c) ordinarily assemble and consolidate or provide for the assembling and consolidating of shipments; both normally perform or provide for the performance of break-bulk and distributing operations with respect to such consolidated shipments; and both utilize, for at least part of the transportation of such shipments, the services of a carrier or carriers subject to part I, II, or III of the act. In essence, then, the shipper obtains from the nonprofit group or association of which it is a member the same physical transportation service as that which it would receive from any recognized forwarder. The functional distinction between regulated and nonregulated consolidating and distributing operations is therefore to be found not in their physical service characteristics which are thus identical for all practical purposes. Instead, the regulated freight forwarder is distinguished by statute from the nonregulated shippers' organization by the fact that it holds itself out to the general public, for compensation, to deliver safely at destination those shipments entrusted to its care."

"Whether an activity conducted by a shippers' group or association and otherwise meeting the physical requirements of a forwarding service is held out to the general public for compensation so as to constitute the group or association a vendor of forwarding service, i.e., a freight forwarder, ultimately and necessarily depends upon the factual relationship between the group or association performing the operation and the recipients or beneficiaries of such operation."

The shippers' association is a membership operation, distinguished from other organizations by the agency relationship between the members and the group. The shippers' association is not an organization that sells a service to members, it is an agent of the members and it acts solely on their behalf.

The statute quoted above gives only brief statements about qualifying features. The association must operate to secure benefits of carload,, truckload or other volume rates; it must operate to obtain those benefits for its members; and it must operate on a nonprofit basis. A number of other principles, however, are implied by those statements and some have been elaborated by the Commission and the courts. The following discussion cannot cover all stated and implied requirements for 402(c); it merely suggests ideas to consider in formation of an exempt freight forwarder shippers' association.

For summary purposes the characteristics that a shippers' association must possess to receive section 402(c)(1) status in Part IV can be described by four principles. First, the association must be under the control and direction of the association members. Second, the essential risks and burdens of the enterprise must be borne by the association. Third, the association must be operated for benefit of members only. Finally, the association must be operated on a nonprofit basis.

Various decisions have listed member control and assumption of risks and burdens as the major point of contention, although member benefit and nonprofit qualification characteristics are required. In fact, the four principles cannot be separated. Total operation of the association must meet all requirements. If the association does not reflect one of the principles, very likely it will not meet others.

From the point of view of shippers and growers contemplating a shippers' association, the principle of member control is paramount. Brief exposure to Commission decisions and court cases suggests that the first step in the failure of a shippers' association to conform to the law is lack of true member control.

A Federal District Court in the case C-Line, Inc., v. United States, 376 F. Supp. 1043 (D. R. I. 1974), stated: "There is a well defined relationship between an exempt shippers' association and its members, which is characterized by control of membership over transportation activities of the association." As stated in Atlanta Shippers Association--Investigation of Operations, 316 I. C. C. 259 (1962):

"If any person or persons, other than the shipper-members themselves, possess even the right or privilege to control, or in fact actually control, the freight consolidation and distribution services, it is they, and not the shippers, who through the purported association are performing such activities; in such event, the operation being conducted in the name of the shippers or in the name of their group or association is not within the exclusion of section 402(c) but is, in substance, a common carrier freight forwarding service for which authority is required. In these circumstances, the controlling persons will be regarded as having assumed the necessary responsibility for the transportation from point of receipt to point of destination within the meaning of the freight forwarder definition."

Conscious delegation of all responsibility is also a loss of control. "Where it is shown that the association members, though enjoying the benefits of a complete transportation service at volume rates, have not retained effective control over the movement of their freight but, instead, have delegated all responsibility therefore to purported agents or employees, then for all practical purposes, they have invested the latter with the fundamental characteristics of an included entrepreneur, the operations of which, if otherwise within the definition of a freight forwarder, are subject to the Act's licensing requirements." New Orleans Shippers Association, Investigation of Operations, 323 I. C. C. 619 (1964).

A clear example of the member control problem is given in Freight Forwarders Institute v. United States, 263 F. Supp. 460 (S. D. N. Y. 1967). The association in question was Piggy-Back Shippers Association of Florida, organized by a Mr. Helin to use truck-on-flat-car services. Helin contacted the initial group of shipper members, drew up the association's articles and bylaws, called the organizational meeting, actually appointed the "elected" members of the board of directors, and obtained a contract as general manager with compensation based on total tonnage shipped. Thereafter Helin exercised a free hand, unencumbered by effective control by the board of directors whose principal decision at board meetings amounted to approval of new membership applications secured by Helin. It was held that requisite membership control was lacking.

Dissatisfaction with Helin's operations led the members to take control of the association, hire a new manager and operate as a proper association. At that point piggy-back was no longer a "paper" association of the general manager's own design or a cloak under which an independent entrepreneur was acting, and was held to be operating in conformance with 402(c) requirements.

The association must not permit others to assume the risks and burdens of the enterprise. Responsibility for transportation from point of receipt to point of destination was not found in the association where "persons other than the shipper members of the association bear the essential risks and burdens of the consolidating and distributing operations." Atlanta Shippers Association--Investigation of Operations, 316 I. C. C. 259 (1962). It was also stated:

"The same conclusion clearly must obtain in those situations in which persons other than the shipper-members of the association bear the essential risks and burdens of the consolidating and distributing operations in question. Where, however, the shipper-members themselves, to the exclusion of all others, control, direct, and dominate the activities in question and assume jointly and severally all the risks and burdens of conducting such operations, such consequences cannot be said to result and the operations would be of the character specifically safeguarded by section 402 (c) of the act."

Risk and responsibility assumption is closely associated with control. In Columbia Shippers and Receivers Association v. United States, 301 F. Supp. 310 (D. Del. 1969), a challenge to assumption of risk was defeated when the court stated that retention by members of the right to control and dominate the association is an indication that essential risks and burdens have not been passed on to third parties.

A shippers' association must be operated for the benefit of the members as described in the statute. Two requirements are tied up in this principle. Benefits must flow only to members, and benefits must be associated with transportation cost saving, not from profitable operation of a transportation system. The Commission in Atlanta Shippers Association--Investigation of Operations, 316 I. C. C. 259 (1962) summarizes the two requirements:

"The essential predicate of any bona fide shippers' association is that the association, at all times and with respect to each less-than-truckload or less-than-carload shipment moving in its service, must act as agent for its lawful shipper-members in reducing the "transportation costs to the members through savings effected in cooperation with other members who likewise employ the association as transportation agent." In other words, the avowed purpose, and the practical result, of an association's combining freight of its members must not be to obtain any benefit for the shipper other than the lowering of the transportation costs of the members through savings effected in cooperation with other members "who likewise employ the association agent." As a consequence, in order to avoid being characterized as a "for compensation" or for-hire freight forwarder, a group or association of shippers must affirmatively stand aloof to the lure of a public calling and may not lawfully handle nonmembers' shipments which have no connection with, nor fundamental relation to, the business of its shipper-members. Whenever the freight consolidating and distributing services performed in connection with nonmember shipments by the group or association of shippers is supplied with a purpose to profit from the effort itself as distinguished from a purpose merely to obtain for its members the benefits of carload, truckload, or other volume rates, then the operation is, in substance, a common carrier freight forwarding service for compensation."

The nonprofit nature of a 402(c) shippers' association is explicit. The nonprofit characteristic also flows from the nature of the association and its relationship to its members. In a case that questioned the use of f.o.b. shipping, the Commission held that such a practice destroyed the nonprofit status because the association did not take responsibility for shipping costs, the benefits being a profit to the association. In its rejection of that view, the U.S. Supreme Court in United States v. Pacific Coast Wholesalers' Association, 388 U.S. 689, 70 S.Ct. 411, 94 L. Ed. 474 (1950) discussed the meaning of nonprofit operations. "(A lower court) considered as decisive that no shipments by the association were ever undertaken except at the behest and for the benefit of a member. Looking to the agency between member and association, rather than that between buyer and seller, the court saw no reasonable grounds for ruling that the association was on a profit basis, or that it was holding its services out to the general public. We agree."

In a situation where nonmembers operated the association, a court scrutinized the substantial income received by those who did control the association. They listed as items of an expense account such things as entertainment, travel, sales promotion, and Christmas gifts. Though the association itself did not have a profit, the court said that "these expenses are typical of a profit-making operation rather than a nonprofit shippers' association". Freight Consolidations Cooperative, Inc. v. United States, 230 F. Supp. 692 (S.D. N.Y. 1964).

Form of Organization

If the association of shippers meets the statutory requirements, the technical form of organization is not restricted. The choice of membership, unincorporated organization or incorporated association is open. A corporation normally insulates its individual shareholders from liability beyond their investment. An argument was made that such insulation made it impossible for the association to meet the assumption of risk and burden rule. That argument, however, was not accepted by the Commission. The "fact of incorporation, standing alone, does not affect the status under Part IV of otherwise lawful shipper-association operations." Atlanta Shippers Association--Investigation of Operations, 322 F.C.C. 273 (1964). The Commission added:

"We do not mean to say, however, that the circumstance of incorporation, and the fact surrounding such incorporation, are not something to be weighed in ascertaining the basic nature and true status of purported shipper-association operations. We will go behind the corporate form in any case to establish the essential facts. These facts, like all others attendant to a given operation, must be weighed and considered together in order to arrive at a correct assessment of the "total" fact situation. And where it appears that the corporate form of enterprise has been purposely chosen as a subterfuge or device by which to escape regulation under the act, appropriate weight will be accorded that fact in finding the operations in question to be those for which authority is required."

Requirements of a shippers' association are entirely compatible with the kind of organization commonly called a cooperative. In fact, one court has said, "A true shippers' association is a nonprofit cooperative, the members bear the burdens as well as share the benefits of its operations. They bear the expenses of the consolidation and distribution operation as well as sharing in any surplus monies that remain in the association's treasury at the end of the year." Freight Consolidators Cooperative, Inc. v. United States, 230 F. Supp. 692 (S.D. N.Y. 1964).

Example: After discussing qualifications and requirements for a 402(c) shippers' association, a description of a properly operating association may be useful. Such a description was given by a Federal District Court in Dal-Worth Shippers Association v. United States, 211 F. Supp. 590 (N.D. Texas 1962): "It was organized (in 1949) as a membership organization under the sponsorship of a group of merchants in Dallas for the purpose of reducing the cost of their transportation from their principal sources of supply. At a later date, the privilege of membership was extended to merchants in the Fort Worth area."

"The Association does not issue shares of stock. Membership is evidenced by a letter of acceptance of a member's application. Services of the association are rendered for members only. There are about 200 members at this time. Control of the association is exercised by a board of directors consisting of 21 persons, representing about 10 percent of the active membership, and an executive committee consisting of 7 members. Under present bylaws, the maximum membership of the board of directors is 25. A manager is employed who oversees the clerical work which constitutes the day-to-day operation of the association. Bylaws permit admission of new members to the association by a majority vote either of the board of directors or the executive committee, although in normal practice a prospective member will be rejected or admitted by unanimous action. No members are solicited by the association or any of its officers. The directors all serve without pay."

"The charges of the association are applied uniformly to all members, but vary as to individual shipments according to their contents and weight. Charges are fixed at a level which returns the cost and tax on the underlying transportation by rail and motor vehicle, consolidating charges, and overhead including depreciation, rent, salaries, telephone, office, and any other costs. If at the end of a 12-month operating period association revenues exceed the expenses, then pursuant to the association bylaws, the excess is prorated on the basis of tonnage and distributed back to the members. Refunds have never exceeded 1 percent of revenue for any operating period and have averaged one-half of one percent."

Once the physical and economic requirements of the recommended system have been worked out, the precise nature of the organization most suitable to achieve the desired ends can be designed. The many decisions on incorporation, taxation, and so forth, will have to be made based on needs and permissible bounds of operation. Such decisions, and specific steps toward implementation, should be made in close consultation with a knowledgeable attorney. Details should always keep sight of the overall goals of shippers and growers.

Managing a TOFC Program

A TOFC program, regardless of the type, will require management that has the necessary expertise to ensure efficient, low-cost service. Management and size of staff are dependent on the type of alternative chosen to control the fleet of trailers--under Plan III using a contract or negotiated agreement, outright purchase of trailers or leased trailers, or using railroad supplied trailers' under Plan II 1/2.

Another influencing factor will be the type of maintenance program--whether a full service lease with maintenance program included, or one set up and operated by shippers.

Staff Requirements

The number of people required to manage either a contract negotiated agreement or a railroad supplied trailer (Plan II 1/2) program would be considerably less than if trailers were purchased, or leased and operated under Plan III.

Similarly, management requirements would also be less if either of the first two programs were chosen. As stated earlier, operating under a contract or negotiated agreement is essentially "buying" the management and staff necessary to do the job. This also holds true under Plan II 1/2 where the railroads supply the equipment. Management of the trailer fleet and its utilization largely rests with the railroad supplying the trailers.

If a decision is made by the shippers to purchase or lease trailers and operate them under a Plan III program then a specialized management and operating staff would be required. Principal types of specialized staff members needed would be as follows:

- Management well versed in rail piggyback operations.
- Freight expeditors to help ensure fast turnaround of trailers.
- Freight solicitors in the market areas to obtain possible backhaul tonnage.
- Tracers to track and account for location and movement of trailers.
- Maintenance personnel, if a self-operated maintenance program is selected.

Administrative and operating personnel would be required for any of the programs.

Commitment Needed

Any alternative transportation program shippers might organize would require a commitment to utilize it to the fullest. A rail piggyback program would require such commitment from each of the parties involved--shippers, receivers, and railroads.

By Shippers

The amount of investment by shippers in facilities and equipment necessary to implement a rail piggyback program would vary greatly depending on whether trailers were purchased or leased. However, an investment would still be required to cover administrative, operational and financing costs.

To protect such an investment, it would be reasonable to require a commitment from each grower and shipper using the service. A commitment by each might include any or all of the following components:

- Agreement to share in organizing, patronizing and financing a shipper-grower controlled organization.
- A minimum guaranteed annual volume based on a fixed amount or on a percentage of total volume shipped.
- Assured regularity of a guaranteed annual volume daily, weekly, or monthly.
- Giving the program the right of first refusal on all shipments.

By Railroads

Railroads providing service for the program would be expected to make necessary commitments to help assure its success and viability. The key to success would largely depend on cost and the level and reliability of service provided by the railroads.

The railroad's commitment might include any or all of the following components:

- A service schedule guaranteeing train arrival at destination ramps within a narrow predetermined time range.
- An agreement on volume rates to release shipper from annual volume requirement if the railroad fails to furnish or pull flatcars.

--A guaranteed contract rate schedule, with provisions for periodic increases to cover costs, that would apply for a sufficient time to permit shipper-growers to recover their investment.

--A schedule for return of empty trailers to point of origin within a reasonable time range.

By Receivers

Primary midwest and northeast recipients of fresh vegetables from California are wholesalers and large grocery chains. At present these receivers determine how and when shipments move because they pay the freight bill.

Needless to say, the cooperation and support of these and other receivers are vital to the success of any grower-shipper controlled program. Thus the degree and extent of receiver commitment should be determined in advance.

Commitment by receivers might include any or all of the following components:

--Agree to receive a percentage of total volume by the grower-shipper controlled piggyback program.

--Contract on an annual basis at a predetermined rate for moving a set volume of produce via the program.

Financing

The financial resources required to establish a Plan III piggyback program depends on the method for acquiring equipment. Direct purchase of the tractors and trailers would require a very substantial investment. Conversely, if pickup and delivery service were contracted for and trailers leased, the only financing required would be for working capital.

We recommend that shippers initially contract for as many services as possible and lease the balance of the equipment rather than acquire it by direct purchase.

A successful operation will depend to a great extent on the commitment of both railroads and shippers. For this reason we recommend that shippers negotiate a lease guarantee with participating railroads based on the anticipated degree of participation. If this is done, railroads will have an additional incentive to provide the kind of service that will enable the program to succeed. With this guarantee, shippers should also be able to negotiate a lower monthly lease.

Initial financial requirements for working capital can come from an organizational assessment of the members. If necessary, the assessment can be supplemented with a loan from a bank or other commercial source.

Potential Problems

A piggyback program as comprehensive and complex as envisioned here will generate problems--mostly of an operating nature. We have identified several of the important problems that must be addressed if a program is implemented.

Backhauls

There are divergent opinions on the importance of backhauls for a Plan III piggyback program. Some believe empty trailers should be returned to the points of origin as quickly and directly as possible without the usual backhaul delays. This idea is based on the theory that shipper investment in trailers is to provide the necessary equipment to meet an immediate need for transportation on the primary movement. Handling backhauls would unduly interfere with the orderly, expeditious return of empty trailers.

Other shippers believe it is economically unfeasible to operate a Plan III piggyback program transcontinentally with trailers loaded only one way. Certainly from a cost standpoint, it makes economic sense to keep trailers productively utilized as much as possible.

At present a large produce shipper is moving lettuce and celery from California to Chicago under Plan III piggyback. Of the more than 2,000 trailers shipped to Chicago yearly since 1975, only about 2 percent return empty. The trailers are furnished to freight forwarders who load them with merchandise for the backhaul. The produce shipper does not charge the forwarders for use of the trailers. He is content to have the trailers returned free without paying the railroad \$739--the charge for hauling two empty trailers from Chicago to the San Francisco Bay Area.

Backhaul problems faced by this shipper and any other shipper using Plan III piggyback are: (1) Making the necessary contacts and arrangements for backhauls; (2) coping with pilferage, vandalism, equipment damage, cleaning, and other possible cost items associated with backhauls; and (3) getting the trailers unloaded in California in reasonable time.

The shipper mentioned earlier solved the first part of this problem by using the services of the trucker who delivers trailers to customers from the unloading ramp in Chicago. The trucker makes the necessary contacts and arrangements with freight forwarders for the return loads to California.

Getting trailers unloaded in California in reasonable time is a frequent problem. A trailer is an attractive short-term storage unit and unfortunately is used that way by some receivers.

If the trailer was owned by the railroad, a demurrage charge could be made for excess time over the unloading time specified in the tariff. However, no such handling incentive is permitted or available on shipper controlled equipment. This problem must be addressed and a solution found if a viable, two-way loaded, Plan III piggyback program is developed.

Problems associated with vandalism, pilferage and equipment damage are a concern when the trailer is being used on a backhaul and beyond the control of the shipper-owner. This is also true of debris left in the trailer after a backhaul movement. On the other hand, the tendency on the part of some railroads to give priority to loaded trailers over empty trailers, particularly when there is a shortage of locomotives, can delay turnaround time considerably on empty return movements.

Turnaround Time

The problem of slow turnaround time of trailers is closely related to the previously discussed backhaul problem. According to information we obtained, following are the ranges of turnaround times now being experienced between Salinas and Chicago. They are based largely on discussions with shippers and receivers using Plan III piggyback:

(a) When trailers are returned empty, the best turnaround time is about 14 days. However, average time is closer to 21 days, (b) When backhauls are obtained, the best turnaround time is about 21 days. Average time is more apt to be about 25 days.

Other Problems

Several more potential problem areas need to be recognized in Plan III piggyback operations. One is associated with trailer supply and maintenance -- recognizing the need for a maintenance program that will reduce delays and the amount of time equipment is out of service. The efficiency of a trailer maintenance program will largely determine the supply of trailers available at a given time.

Handling of loss and damage claims is difficult as there are no rules, regulations, or tariff provisions covering claims levied against shipper-owned equipment. Agreements would need to be worked out between shippers, railroads, and receivers covering liability, validity, and payment of claims.

At present, fresh produce in California is sold FOB point of origin. In other words the buyer takes title to the produce in California, arranges for transportation and pays the transportation charge to market. If a grower-shipper controlled piggyback program is used, the present marketing practice must be modified.

If the benefits of a Plan III piggyback program are to be realized, title to the produce must be retained by the shipper until it is delivered. Benefits to receivers must be demonstrated if the present marketing system is to be changed.

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Appendix table 1--Rail and truck shipments of produce from 14 California shippers by product and month, 1975

Month	:	Lettuce	:	Celery	:	Other	:	Total	:	Rail	:	Truck
<u>Cartons</u>												
January	:	536,564		25,697		535		562,795		136,091		426,705
February	:	660,850		27,499		85		688,434		384,395		304,039
March	:	590,308		44,350		218		634,876		313,455		321,421
April	:	493,368		35,711		175		529,254		244,510		284,744
May	:	1,388,578		40,845		605		1,430,028		799,250		630,778
June	:	1,517,156		39,642		1,253		1,558,051		1,059,398		498,653
July	:	1,233,620		43,825		1,000		1,278,445		913,066		365,379
August	:	1,003,780		15,366		1,182		1,020,328		493,445		526,883
September	:	1,268,002		33,525		1,525		1,303,052		706,980		596,072
October	:	698,078		49,893		2,185		750,156		356,579		393,577
November	:	588,103		43,741		2,458		634,302		238,980		395,322
December	:	437,777		--		--		437,777		188,330		249,447
Annual	:	10,416,184		400,094		11,221		10,827,499		5,834,479		4,993,020

-- = Not applicable.

Appendix table 2--Rail and truck shipments of produce from 14 California shippers by product and month, 1976

Month	:	Lettuce	:	Celery	:	Other	:	Total	:	Rail	:	Truck		
<u>Cartons</u>														
January	:	604,356		29,498		114		633,968		248,147		385,821		
February	:	546,332		25,917		--		572,249		238,243		334,006		
March	:	534,815		34,239		202		569,256		189,712		379,544		
April	:	602,848		24,682		56		627,586		170,696		456,890		
May	:	1,517,907		32,856		51,991		1,602,754		650,743		952,011		
June	:	1,660,756		40,362		38,988		1,740,106		883,808		856,298		
July	:	1,181,444		74,626		37,202		1,293,272		617,158		676,114		
August	:	1,196,445		52,752		42,743		1,291,940		389,269		902,671		
September	:	1,250,754		41,949		42,081		1,334,784		238,221		1,096,563		
October	:	972,888		80,157		39,148		1,092,193		150,427		941,766		
November	:	662,506		75,089		47,337		784,932		209,041		575,891		
December	:	572,157		41,305		24,158		637,620		117,589		520,031		
Annual	:	11,303,208		553,432		324,020		12,180,660		4,103,054		8,077,606		

-- = Not applicable.

Appendix table 3--Shipments of produce by 14 California shippers by destination, product, volume, rail, and truck, 1975^{1/}

Destination	Lettuce	Celery	Other ^{2/}	Total	Rail	Truck
Cartons						
New York, NY	1,477,073	18,672	200	1,495,945	1,121,503	374,442
Boston, MA	761,176	101,297	--	862,473	700,331	162,142
Philadelphia, PA	811,879	26,978	50	838,907	654,211	184,696
Chicago, IL	750,077	6,547	275	756,899	490,286	266,613
Cleveland, OH	535,157	11,302	--	546,459	228,097	318,362
Pittsburgh, PA	523,721	10,589	--	534,310	147,393	386,917
Cincinnati, OH	409,122	38,569	365	448,056	291,825	156,231
Detroit, MI	419,117	21,154	1,239	441,510	262,643	178,867
Washington, DC	403,826	8,786	650	413,262	244,416	168,846
St. Louis, MO	304,362	175	--	304,537	223,478	81,059
Indianapolis, IN	256,580	8,611	50	265,241	32,348	232,893
Buffalo, NY	253,013	1,575	--	254,588	167,360	87,228
Winston Salem, NC	243,856	740	--	244,596	45,061	199,535
Atlanta, GA	243,049	1,345	--	244,394	13,698	230,696
Minneapolis, MN	168,164	22,332	--	190,496	41,348	149,148
Hartford, CT	155,276	31,863	169	187,308	145,295	42,013
Milwaukee, WI	177,608	2,490	60	180,158	41,622	138,536
Miami, FL	135,705	4,875	110	140,690	61,083	79,607
Albany, NY	133,377	4,425	--	137,802	116,113	21,689
Paducah, KY	127,155	3,213	1,050	131,418	65,343	66,075
Grand Rapids, MI	124,838	960	--	125,798	70,592	55,206
Birmingham, AL	110,757	6,749	2,410	119,916	16,437	103,479
Providence, RI	115,161	245	--	115,406	94,352	21,054
Toledo, OH	104,391	7,764	1,650	113,805	650	113,155
Tampa, FL	105,587	1,907	--	107,494	70,222	37,272
Springfield, MA	93,599	10,149	1,350	105,098	92,630	12,468
Nashville, TN	103,839	130	--	103,969	4,358	99,611
Memphis, TN	101,306	594	--	101,900	6,832	95,068
Columbus, OH	93,809	5,707	120	99,636	12,986	86,650
Jacksonville, FL	97,479	1,090	--	98,569	33,981	64,588
Charleston, WV	92,220	549	30	92,799	9,156	83,643
Peoria, IL	84,786	5,390	503	90,679	8,546	82,133
Knoxville, TN	84,646	--	--	84,646	6,942	77,704
Louisville, KY	74,831	205	--	75,036	13,175	61,861
Syracuse, NY	70,712	730	25	71,467	39,492	31,975
Rock Island, IL	60,920	--	--	60,920	45,878	15,042
Rochester, NY	51,607	--	--	51,607	28,964	22,643
Greenville, SC	48,490	--	--	48,490	29,906	18,584
Richmond, VA	43,836	--	--	43,836	6,384	37,452
Green Bay, WI	41,399	1,471	--	42,870	13,176	29,694
Scranton, PA	41,672	1,025	--	42,697	13,100	29,597
Raleigh, NC	39,104	2,485	55	41,644	11,981	29,663
Harrisburg, PA	21,394	16,676	275	38,345	14,161	24,184
Evansville, IN	35,750	--	--	35,750	19,649	16,101
Norfolk, VA	34,072	1,518	35	35,625	9,923	25,702
New Orleans, LA	32,394	2,315	350	35,059	11,293	23,766
Columbia, SC	34,296	590	--	34,886	3,268	31,618
Orlando, FL	26,570	1,395	--	27,965	16,474	11,491
Thomasville, GA	22,541	230	--	22,771	2,500	20,271
Mobile, AL	21,222	805	--	22,027	--	22,027
Savannah, GA	20,329	287	--	20,616	--	20,616
Fort Wayne, IN	17,097	1,180	--	18,277	2,509	15,768
Roanoke, VA	17,438	750	--	18,188	6,718	11,470
Portland, ME	14,875	100	--	14,975	14,275	700
Altoona, PA	10,178	200	20	10,398	1,904	8,494
Duluth, MN	9,354	150	--	9,504	375	9,129
Johnson City, TN	9,178	--	--	9,178	5,482	3,696
Jackson, MS	6,265	950	155	7,370	--	7,370
White River Jct, VT	5,749	--	--	5,749	1,064	4,685
Charlottesville, VA	2,675	125	25	2,825	1,690	1,135
Manchester, NH	525	135	--	660	--	660
Total	10,416,184	400,094	11,221	10,827,499	5,834,479	4,993,020

-- = No recorded shipment.

1/ Shipments to cities within about 50 miles of the 62 cities listed were combined and included in the city totals shown.

2/ Includes broccoli and cauliflower.

Appendix table 4--Shipments of produce by 14 California shippers by destination, product, volume, rail and truck, 1976^{1/}

Destination	Lettuce	Celery	Other ^{2/}	Total	Rail	Truck
<u>Cartons</u>						
New York, NY	1,437,143	75,271	150,616	1,663,030	841,764	821,266
Philadelphia, PA	1,334,401	27,071	15,916	1,377,388	792,265	585,123
Boston, MA	941,137	70,718	18,473	1,030,328	554,599	475,729
Chicago, IL	663,365	11,525	11,955	686,845	332,608	354,237
Cleveland, OH	490,066	33,185	32,841	556,092	142,828	413,264
Pittsburgh, PA	504,574	21,574	6,694	532,842	72,041	460,801
Washington, DC	457,392	21,135	925	479,452	161,412	318,040
Cincinnati, OH	432,817	41,947	1,490	476,254	189,088	287,166
Detroit, MI	335,676	8,106	16,380	360,162	88,413	271,749
St. Louis, MO	300,123	4,034	14,839	318,996	158,060	160,936
Minneapolis, MN	253,742	34,969	681	289,392	21,354	268,038
Miami, FL	235,995	21,439	2,266	259,700	43,367	216,333
Indianapolis, IN	242,924	6,033	5,507	254,464	4,478	249,986
Buffalo, NY	249,672	1,495	1	251,168	81,409	169,759
Winston Salem, NC	218,710	1,736	--	220,446	9,462	210,984
Atlanta, GA	213,170	2,844	1,647	217,661	1,350	216,311
Columbus, OH	144,596	6,001	6,548	157,145	9,742	147,403
Milwaukee, WI	153,666	2,851	--	156,517	20,064	136,453
Hartford, CT	105,925	43,090	65	149,080	60,759	88,321
Paducah, KY	134,832	4,297	1,396	140,525	40,855	99,670
Nashville, TN	129,825	1,240	4,368	135,433	4,064	131,369
Springfield, MA	115,512	12,185	566	128,263	70,819	57,444
Louisville, KY	116,443	2,079	6,585	125,107	7,515	117,592
Peoria, IL	101,890	15,087	4,279	121,256	7,062	114,194
Albany, NY	119,317	950	350	120,617	86,641	33,976
Norfolk, VA	115,009	814	--	115,823	--	115,823
Rock Island, IL	112,734	--	--	112,734	69,495	43,239
Providence, RI	106,202	80	--	106,282	64,721	41,561
Grand Rapids, MI	93,728	5,544	6,678	105,950	6,865	99,085
Richmond, VA	83,087	19,095	--	102,182	1,250	100,932
Tampa, FL	89,492	1,759	165	91,416	46,629	44,787
Toledo, OH	86,933	3,334	245	90,512	594	89,918
Birmingham, AL	85,994	3,549	310	89,853	5,480	84,373
Charleston, WV	85,603	1,485	--	87,088	1,872	85,216
Memphis, TN	85,493	688	--	86,181	--	86,181
Jacksonville, FL	76,474	5,726	--	82,200	20,002	62,198
Knoxville, TN	78,398	300	65	78,763	--	78,763
Green Bay, WI	66,970	8,281	3	75,254	4,955	70,299
Orlando, FL	70,532	2,921	--	73,453	8,600	64,853
Syracuse, NY	68,277	3,126	400	71,803	26,145	45,658
Raleigh, NC	69,756	1,535	165	71,456	1,325	70,131
Rochester, NY	65,712	73	150	65,935	16,676	49,259
Harrisburg, PA	53,870	7,739	105	61,714	5,107	56,607
Greenville, SC	48,324	--	425	48,749	2,500	46,249
Scranton, PA	38,260	1,617	5,782	45,659	6,172	39,487
Columbia, SC	38,916	800	--	39,716	--	39,716
New Orleans, LA	31,373	3,157	1,023	35,553	100	35,453
Mobile, AL	32,284	1,935	--	34,219	--	34,219
Charlottesville, VA	30,290	1,330	201	31,821	--	31,821
Fort Wayne, IN	30,081	895	740	31,716	70	31,646
Evansville, IN	22,535	300	--	22,835	3,698	19,137
Thomasville, GA	18,248	670	3,125	22,043	2,715	19,328
Savannah, GA	20,480	800	--	21,280	--	21,280
Altoona, PA	20,032	1,000	--	21,032	6,064	14,968
Roanoke, VA	18,939	250	15	19,204	--	19,204
Jackson, MS	11,044	754	35	11,833	--	11,833
Johnson City, TN	7,359	40	--	7,399	--	7,399
Manchester, NH	2,543	2,079	--	4,622	--	4,622
White River Jct, VT	3,363	--	--	3,363	--	3,363
Gault Ste Marie, MI	1,120	--	--	1,120	--	1,120
Portland, ME	--	894	--	894	--	894
Duluth, MN	840	--	--	840	--	840
Total	11,303,208	553,432	324,020	12,180,660	4,103,054	8,077,606

-- = No recorded shipment.

1/ Shipments to cities within about 50 miles of the 62 cities listed were combined and included in the city totals shown.

2/ Includes broccoli and cauliflower.

Appendix table 5--Average weekly truckload rate quotations for lettuce from Salinas, Calif., to major cities in the Midwest and Northeast¹

Date	Destinations				
	Chicago	Detroit	Philadelphia	Boston	New York
<u>Dollars per load²</u>					
<u>May 1975</u>					
1	1,250	1,325	1,775	1,775	1,775
8	1,275	1,500	1,750	1,800	1,800
15	1,525	1,700	1,900	2,000	2,000
22	1,650	1,800	2,300	2,500	2,500
31	1,800	1,800	2,500	2,500	2,500
<u>June 1975</u>					
5	2,000	2,000	2,650	2,650	2,650
12	1,900	2,100	2,500	2,650	2,650
19	1,500	1,650	1,800	2,000	1,950
26	1,500	1,500	1,800	1,800	1,800
<u>July 1975</u>					
3	1,600	1,650	1,900	2,100	1,900
10	2,000	2,000	2,350	2,350	2,350
17	1,900	2,000	2,200	2,400	2,400
25	1,600	1,675	1,900	1,900	1,900
31	1,450	1,750	1,850	2,000	1,850
<u>Aug. 1975</u>					
4	1,450	1,450	1,800	2,200	2,000
7	1,450	1,750	1,850	2,000	1,850
14	1,475	1,500	1,950	2,150	2,050
21	1,500	1,675	1,850	2,100	1,950
38	1,450	1,650	1,950	2,050	2,000
<u>Sept. 1975</u>					
4	1,650	1,750	1,950	2,250	2,150
11	1,600	1,800	2,500	2,550	2,500
18	1,600	1,700	2,100	2,400	2,250
25	1,400	1,500	2,000	2,100	2,000
<u>Oct. 1975</u>					
2	1,400	1,600	1,800	2,000	1,900
9	1,600	1,700	1,900	2,200	2,100
23	1,600	1,700	1,900	2,100	2,000
<u>Nov. 1975</u>					
14	1,350	1,700	1,675	2,000	1,975
20	1,400	1,500	1,900	2,000	1,900
27	1,500	1,650	1,775	2,000	1,900
<u>Dec. 1975</u>					
4	1,500	1,700	1,800	2,000	1,900
11	1,450	1,650	2,000	2,050	2,000
18	1,350	1,550	1,850	1,950	1,850
<u>Jan. 1976</u>					
2	1,450	1,700	1,900	2,100	2,000
8	1,300	1,600	1,800	2,000	1,850
15	1,300	1,650	1,800	1,900	1,875
22	1,300	1,700	1,800	1,900	1,800
29	1,250	1,550	1,775	1,900	1,875
<u>Feb. 1976</u>					
5	1,300	1,575	1,750	1,900	1,850
12	1,200	1,500	1,650	1,800	1,775
26	1,400	1,800	1,800	1,800	1,800
<u>Mar. 1976</u>					
4	1,650	1,950	2,050	2,300	2,300
22	1,475	1,500	1,900	2,000	1,975
25	1,700	1,750	2,100	2,250	2,100

See end of table for footnote references.

Continued--

Appendix table 5--Average weekly truckload rate quotations for lettuce from Salinas, Calif., to major cities in the Midwest and Northeast/¹--continued

Date	Destinations				
	Chicago	Detroit	Philadelphia	Boston	New York
<u>Dollars per load²</u>					
<u>Apr. 1976</u>					
1	1,725	2,150	2,300	2,450	2,350
15	1,550	1,950	2,100	2,250	2,150
22	1,600	1,700	1,950	2,250	2,150
29	1,450	1,550	1,950	2,200	2,050
<u>May 1976</u>					
6	1,750	1,800	2,400	2,550	2,400
13	1,700	2,000	2,300	2,400	2,300
20	1,900	2,050	2,200	2,450	2,350
27	1,800	1,950	2,100	2,200	2,100
<u>June 1976</u>					
3	1,700	1,900	2,250	2,500	2,300
10	2,200	2,500	2,900	3,050	3,000
17	2,200	2,400	2,900	3,000	2,900
24	1,950	2,150	2,700	2,900	2,750
<u>July 1976</u>					
1	1,750	1,950	2,500	2,750	2,550
8	1,850	2,000	2,400	2,650	2,500
15	1,850	2,100	2,500	2,700	2,600
22	1,900	2,000	2,200	2,500	2,400
29	1,800	1,900	2,400	2,600	2,500
<u>Aug. 1976</u>					
5	1,700	2,100	2,300	2,450	2,250
12	1,800	1,950	2,350	2,600	2,500
19	1,800	1,950	2,300	2,500	2,400
26	1,800	2,000	2,300	2,500	2,400
<u>Sept. 1976</u>					
2	1,750	1,900	2,250	2,400	2,250
9	1,700	1,850	2,150	2,400	2,250
17	2,000	2,150	2,600	2,850	2,700
23	1,750	2,000	2,500	2,750	2,700
30	1,550	1,800	1,900	2,100	2,000
<u>Oct. 1976</u>					
4	1,650	1,800	1,850	2,100	2,000
7	1,650	1,800	1,825	2,100	1,950
14	1,750	1,900	2,050	2,250	2,150
21	1,600	1,700	2,000	2,200	2,100
28	1,750	1,900	2,050	2,300	2,200
<u>Nov. 1976</u>					
4	1,750	1,900	2,100	2,400	2,200
10	1,800	1,950	2,100	2,400	2,250
18	1,750	1,900	2,100	2,400	2,200
24	1,800	1,875	2,000	2,200	2,100
<u>Dec. 1976</u>					
2	1,750	1,900	2,050	2,350	2,250
9	1,500	1,700	1,900	2,100	2,000
16	1,650	1,850	1,950	2,250	2,100
22	1,600	1,700	1,900	2,100	2,000
30	1,450	1,700	1,900	2,100	2,000
<u>Jan. 1977</u>					
13	1,500	1,700	1,900	1,900	1,900
21	1,650	1,800	1,900	2,050	1,950
27	1,900	2,050	2,850	3,000	2,900

See end of table for footnote references.

Continued--

Appendix table 5--Average weekly truckload rate quotations for lettuce from Salinas, Calif., to major cities in the Midwest and Northeast/¹--continued

Date	Chicago	Detroit	Philadelphia	Boston	New York
Dollars per load ² /					
Feb. 1977					
4	2,000	2,200	2,350	2,600	2,500
10	1,950	2,050	2,300	2,500	2,400
17	1,450	1,550	1,850	2,100	2,000
24	1,500	1,700	1,900	2,100	2,000
Mar. 1977					
3	1,650	1,800	2,050	2,300	2,150
10	1,700	1,800	2,100	2,300	2,200
17	1,500	1,700	2,000	2,300	2,200
24	1,500	1,700	2,000	2,200	2,100
31	1,950	2,250	2,350	2,500	2,450
Apr. 1977					
7	1,850	2,050	2,350	2,500	2,400
14	1,675	1,850	2,300	2,400	2,350
21	1,700	1,900	2,100	2,400	2,300
28	1,750	1,950	2,200	2,375	2,250
May 1977					
5	1,800	1,900	2,200	2,400	2,300
12	1,650	1,800	2,200	2,400	2,300
19	1,800	1,900	2,300	2,500	2,350
26	1,800	1,950	2,450	2,600	2,500
June 1977					
2	1,950	2,150	2,500	2,650	2,600
9	2,000	2,250	2,750	2,950	2,750
16	2,000	2,100	2,800	3,000	2,900
23	2,050	2,300	2,500	2,700	2,650
30	1,950	2,050	2,500	2,700	2,600
July 1977					
7	1,950	2,100	2,600	2,800	2,650
14	2,050	2,150	2,800	2,950	2,850
21	2,050	2,200	2,800	3,000	2,850
28	1,850	2,000	2,400	2,650	2,500
Aug. 1977					
4	1,800	1,900	2,200	2,400	2,300
11	1,800	1,900	2,200	2,400	2,300
18	1,900	2,000	2,250	2,500	2,400
25	1,800	2,000	2,250	2,400	2,300
Sept. 1977					
1	1,850	1,950	2,300	2,450	2,350
15	1,300	1,900	2,200	2,400	2,300
22	1,800	1,900	2,100	2,300	2,200
29	1,850	1,900	2,250	2,500	2,350
Oct. 1977					
6	1,800	1,900	2,200	2,500	2,350
13	1,850	1,900	2,200	2,450	2,300
20	1,800	1,900	2,300	2,500	2,400
27	1,800	1,900	2,100	2,300	2,200
Nov. 1977					
3	1,600	1,700	2,000	2,200	2,100
10	1,600	1,700	1,950	2,150	2,050
17	1,550	1,900	1,900	2,100	1,950
23	1,550	1,900	1,850	2,100	1,950
Dec. 1977					
1	1,650	1,800	1,900	2,100	2,000
8	1,700	1,800	1,900	2,100	1,950
15	1,800	1,900	2,100	2,300	2,200
22	1,700	1,800	1,900	2,050	1,950
29	1,500	1,750	1,800	2,050	1,950

See end of table for footnote references.

Continued--

Appendix table 5--Average weekly truckload rate quotations for lettuce from Salinas, Calif., to major cities in the Midwest and Northeast^{1/}--continued

Date	Destinations				
	Chicago	Detroit	Philadelphia	Boston	New York
Dollars per load ^{2/}					
Jan. 1978					
5	1,650	1,750	2,150	2,350	2,250
12	1,550	1,650	2,000	2,200	2,000
19	1,600	1,800	2,100	2,300	2,200
27	1,650	1,750	2,150	2,350	2,250
Feb. 1978					
2	2,050	2,200	2,350	2,550	2,500
9	2,000	2,250	2,550	2,800	2,650
16	1,950	2,050	2,400	2,600	2,500
23	1,900	2,100	2,200	2,400	2,300
Mar. 1978					
3	1,750	1,950	2,200	2,400	2,300
9	1,800	1,950	2,300	2,500	2,400
16	1,850	2,100	2,500	2,750	2,650
23	1,750	2,000	2,200	2,500	2,300
30	1,800	1,900	2,100	2,300	2,200
Apr. 1978					
6	1,800	1,900	2,000	2,250	2,050
13	1,700	1,800	1,950	2,200	2,100
20	1,700	1,900	2,000	2,200	2,100
27	1,800	1,900	2,000	2,200	2,100

1/ Data from records of Pacific Fruit Express Company, Salinas, Calif. Based on reports from shippers of daily truck rate quotations.

2/ Based on truckloads of 800 cartons.

Appendix table 6--Single car round trip railroad cost with empty trailer return. (45,000-pound one-way load per trailer--two trailers per car on loaded haul)

Single Car

Salinas to Chicago

Salinas to Council Bluffs	\$ 1,031.73
Council Bluffs to Chicago	<u>282.04</u>
Total cost to Chicago	\$ 1,313.77
Inflation factor (1974 to 1978)	1.30
Cost at 1978 level	<u>1,707.90</u>
Car rental (\$6.11 X 11)	67.21
Total cost	\$ 1,775.11
Cost per trailer	887.56
Cost per cwt.	<u>1.97</u>

Salinas to Harrisburg

Salinas to Council Bluffs	\$ 1,031.73
Council Bluffs to Chicago	219.36
Chicago -- rubber interchange	345.72
Chicago -- rail interchange	114.20
Chicago to Harrisburg	445.02
Total cost (excluding Chicago)	1,696.11
Inflation factor (1974 to 1978)	1.30
Cost at 1978 level	<u>2,204.94</u>
Chicago rubber interchange (1974 to 1978)(X 1.30)	449.44
Car rental	97.76
Total cost	2,752.14
Cost per trailer	1,376.07
Cost per cwt. (÷900) with rubber interchange	<u>3.06</u>
Cost at 1978 level	2,204.94
Chicago rail interchange (1978 level)(1.10)	125.62
Car rental	97.76
Total cost	2,428.32
Cost per trailer	1,214.16
Cost per cwt. (÷900) with rail	<u>2.70</u>

Salinas to Syracuse

Salinas to Council Bluffs	\$ 1,031.73
Council Bluffs to Chicago	219.36
Chicago -- rubber interchange	345.72
Chicago -- rail interchange	114.20
Chicago to Syracuse	410.16
Total cost (excluding Chicago)	1,661.25
Inflation factor (1974 to 1978)	1.30
Cost at 1978 level	<u>2,159.63</u>
Chicago rubber interchange (1974 to 1978)(x1.30)	449.44
Car rental (\$6.11 x 16)	97.76
Total cost	2,706.83
Cost per trailer	1,353.41
Cost per cwt. (÷900) with rubber interchange	<u>3.01</u>
Cost at 1978 level	2,159.63
Chicago rail interchange (1978 level)(1.10)	125.62
Car rental	97.76
Total cost	2,383.01
Cost per trailer	1,191.51
Cost per cwt. (÷900) with rail interchange	<u>2.65</u>

Appendix table 7--Car trainload round trip railroad cost with empty trailer return. (90 trailers with 45,000 pound one-way load)

Trainload

Salinas, Calif., to Chicago

Cost of each railroad			
Southern Pacific	\$25,118.04		
Union Pacific	21,540.22		
Chicago & North Western	<u>15,287.19</u>		
Direct railroad cost			\$61,945.45
TOFC per diem cost			
Car days (per car)	10		
Cost per day	6.11		
Cost per car (including empty return)	\$ 61.10		
Number of cars	<u>45</u>		
Total car cost			2,749.50
Fringe benefits - crews			
Total crew cost	4,524.58		
Fringe benefit ratio	<u>23%</u>		
Fringe benefit			1,040.65
Total costs			<u>\$65,735.60</u>
Inflation rate to 1978 level			
Expenses excluding car costs (mileage rental)	\$53,091.67		
Inflation rate	<u>10%</u>		
Inflation inclusion			<u>5.309.17</u>
Total cost			\$71,044.77
Cost per car			1,578.77
Cost per trailer			789.39
Cost per cwt.			1.75

Salinas, Calif., to Harrisburg, Pa.

Cost each railroad			
Southern Pacific	\$25,118.04		
Union Pacific	21,540.22		
Chicago & North Western	3,750.09		
Chicago Interchange	4,316.85		
Council	<u>24,585.56</u>		
Direct Railroad cost			\$85,310.76
TOFC per diem cost			
Car days (per car)	15		
Cost per day	6.11		
Cost per car (including empty return)	\$91.65		
Number of cars	<u>45</u>		
Total car cost			\$ 4,124.25
Fringe benefits - crews			
Total crew cost	5,882.97		
Fringe benefits ratio	<u>23%</u>		
Fringe benefits			1,353.08
Total costs			<u>\$90,788.09</u>
Inflation rate to 1978 level			
Expenses excluding car costs (mileage rental)	74,166.06		
Inflation rate	<u>10%</u>		
Inflation inclusion			<u>7,416.61</u>
Total cost			\$98,204.70
Cost per car			2,182.33
Cost per trailer			1,091.16
Cost per cwt.			2.42

--continued

Appendix table 7-- continued

TrainloadSalinas, Calif., to Syracuse, N. Y.

Cost of each railroad	
Southern Pacific	\$25,118.04
Union Pacific	21,540.22
Chicago & North Western	9,750.09
Chicago Interchange	4,316.85
Council	<u>23,709.02</u>
Direct railroad cost	\$84,434.22
TOFC per diem cost	
Car days (per car)	15
Cost per day	6.11
Cost per car (including empty return)	<u>91.65</u>
Number of cars	45
Total car cost	\$ 4,124.25
Fringe benefits - crews	
Total crew cost	5,864.86
Fringe benefit ratio	23%
Fringe benefits	<u>1,348.92</u>
Total costs	\$89.907.39
Inflation rate to 1978 level	
Expenses excluding car cost (mileage rental)	\$73,395.09
Inflation rate	<u>10%</u>
Inflation inclusion	<u>7,339.51</u>
Total cost	\$97,246.90
Cost per car	2,161.04
Cost per trailer	1,080.52
Cost per cwt.	2.40

Other Publications Available

Motortrucks Operated by Farmer Cooperatives. Eldon E. Brooks and Earl B. Miller. FCS Research Report 47. 1978. 24 pp.

Railcar Coordination Among Cooperatives. Robert J. Byrne and Earl B. Miller. FCS Research Report 43. 1977. 16 pp.

Trucking: Lease or Buy? Eldon E. Brooks and James R. Jacks. FCS Research Report 42. 1977. 20 pp.

Transportation Activities--Selected Farmer Cooperatives. Earl B. Miller. FCS Information 96. 1974. 15 pp.

Major Regional Cooperative Supply Operations--Years Ended in 1974 and 1975. J. Warren Mather. FCS Research Report 40. 1977. 110 pp.

Farmer Cooperative Publications. Compiled by Marjorie Christie. FCS Information 4. Revised 1977. 44 pp.

For copies, write: Economics, Statistics, and Cooperatives Service, U. S. Department of Agriculture, Room 550, GHI Building, 500 12th St., S. W., Washington, D. C. 20250.

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